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The Outlook

1948 in Retrospect

LOOKING back on the year that is just closing, one feels that although it was not one of the best in the history of British aviation, neither was it among the worst. That it failed to fulfil all our hopes was scarcely surprising in view of the difficulties with which the whole world seems to be struggling, and of which this country has had its full share. Some of these were forced upon us; others must be admitted to have been largely of our own making.

Perhaps the achievement which has most impressed the world is the Berlin air lift. Few would have believed that the Germans in the non-Soviet sections of Berlin could have been not only kept supplied with necessities, but that actually there was a small increase in stocks. The Americans have shared with the R.A.F. and civil British operators the honour of having foiled Russian attempts to drive us out of Berlin, and unless the weather decides to side with Soviet Russia, we look like being able to keep the Berliners from freezing or starving to death during the coming winter months.

In civil aviation the year has had its disappointments. The Corporations have continued to make heavy financial losses, and there is no good reason to hope that these will be turned into profits during 1949. The most we can hope for is that the losses will be smaller. New and more suitable aircraft types will help towards that end, but other measures will have to be taken to supplement the benefits which the new aircraft types an bestow. A more realistic outlook, and better business management, will have to be achieved.

The Royal Air Force has had one of the most difficult years of its existence, and it cannot be said that the steps which have been taken to encourage recruiting have been particularly successful. The new rates of pay, and other improvements foreshadowed, do no more than scratch the surface. In spite of the good work done by individuals and units, struggling against heavy odds, the lack of man-power has had a serious effect upon the maintenance of service aircraft, and unless energetic action is taken, the proportion of aircraft wearing a "u.s." label is likely to increase. Pressure must, as Sir Philip Joubert stated in his article last week, come from the people if anything worth while is to result.

In spite of all its difficulties, the Royal Air Force has some outstanding achievements to its credit, in addition to its share in the Berlin air lift. There was, for example, the first jet-propelled transatlantic flight (by a Vampire squadron), followed by a very successful visit to the United States. Several goodwill visits were paid to various countries, and some useful training flights to distant parts of the world were completed. The Auxiliary Air Force has been honoured by being given the Royal prefix, and as fighter squadrons has joined our first line of defence. It is to be regretted that its re-equipment with jet fighters has been slower than was hoped. The R.A.F.V.R. is still being stepmotherly treated in the matter of its flying equipment, and much enthusiastic support is being lost as a result.

Technical Progress

WHEN it comes to flying equipment for the R.A.F. and for civil aviation, the year has been one of consolidation rather than of spectacular progress. It is only necessary to mention, by way of an example, the very remarkable endurance tests made with several turbo-jet and turbo-prop units. These showed the remarkable degree of reliability that British firms have achieved in this field. The metallurgist has played an important and not always recognized part in this development, as well as in making possible gradually increasing output from a given unit.

On the military aircraft side, several new and extremely promising types are being developed, and some

have gone into production. This applies to fighters. Of new jet-propelled bombers there is still no news, a fact which has given rise to some uneasiness.

Several world's records fell to British machines during the year, and there are several others which could easily be tackled. For instance, the world's speed record for seaplanes would be within easy reach of the Saro S.R. A1. The record over 100-km. closed circuit was beaten three times during the year. First by S/L. Waterton on a Gloster Meteor, at 542.94 m.p.h. Then by Mr. Lithgow on a Vickers-Supermarine Attacker, at 564.881 m.p.h., and finally by Mr. John Derry, who averaged 605.23 m.p.h. on a de Havilland D.H.108 with swept-back wings.

Another de Havilland machine raised the world's altitude record to 59,492ft. This was a modified Vampire, piloted by G/C. John Cunningham, and although less spectacular than the closed-circuit record, it is of greater practical value in connection with jet-propelled fighter aircraft, which have to reach great altitudes for bomber interception. Even the standard Vampire is known to be particularly good at altitude, retaining its pleasant handling characteristics and manœuvrability at heights, due to the relatively low span-loading.

At the S.B.A.C. Display at Farnborough in September the outward and visible results of the British aircraft industry's genius were patent to every visitor. The industry's contribution to our exports has been such as to give cause for great satisfaction.

In spite of a late start, the present small British rotary-wing industry has done remarkably well during the year. It has produced the world's fastest helicopter, as well as the world's largest, and the experimental mail service operated by the B.E.A. Helicopter Unit has provided valuable experience for future application.

Discipline and Democracy

NATION-WIDE attention has been drawn to shortcomings in the Royal Air Force by the recent *Flight* articles by Air Chief Marshal Sir Philip Joubert, quoted extensively in the National Press. That different Dailies should stress different aspects of these articles was natural enough, but on the whole the Press has given a fair summary of the main points in Sir Philip's arguments.

It was not to be expected that our own readers would all agree with the Air Chief Marshal. Our Correspondence pages since the publication of the articles have disclosed differing views, and others, for which we have not been able to find space, will be published in subsequent issues. One of the shortcomings stressed by Sir Philip was that of discipline. "What we want," he wrote, "is more and not less discipline, but it must be administered by officers and non-commissioned officers who have been trained properly in the art of man management."

How right Sir Philip is was shown the other day, when complaints were made to the S.o.S. at a R.A.F. station that visits by V.I.P.s interfered with the Naafi break! That any member of the R.A.F. can be so narrow-minded passes understanding. The incident is a good match for the "strike" at Halton some time ago, when the boys were annoyed because they were not permitted to slouch around in effeminate haircuts.

That discipline is sometimes of a misguided sort can be accepted, but that merely proves Sir Philip's contention that officers and n.c.o.s must be properly trained to look after their men, a fact which does not appear to be realized by the authorities.

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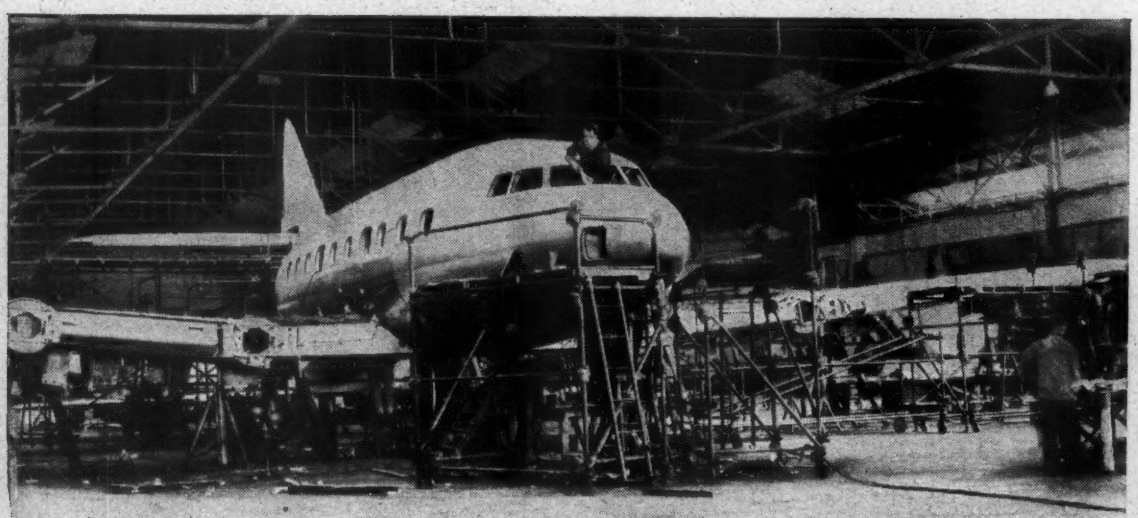


A 1949 MODEL: The first Armstrong Whitworth Apollo—one of numerous important British aircraft scheduled for completion and testing next year—on the stocks at Baginton. Four Armstrong Siddeley Mambas are being fitted; thus the Apollo will be first transport aircraft in the world to fly with axial-flow turboprop power units.

REVIEW of 1948

The S.B.A.C. Exhibition and Display in September was the outstanding aeronautical event of the year.

A Synoptic Retrospect of the Year's Highlights in British Aviation

IN many ways this year of grace, 1948, now drawing to a quasi-peaceful end, has been particularly eventful aeronautically. Much of the turbulent backwash of war which afflicted the industry during 1946 and 1947 has smoothed itself out, and there is now a rather more stable tempo to the aeronautical pulse.

New aircraft in the military and civil fields have engaged world-wide interest, more particularly the beautiful Hawker P. 1040, the Vickers Nene-Viking, Viscount and the Avro Tudor VIII, these last three being the first gas turbine-powered research airliners of their type in the world to fly. In the whirling field, too, we have great and small achievements in the shapes of the Cierva Air Horse and Skeeter, aside from the Gyrodyne world's helicopter speed record.

The new military trainers, Balliol and Athena, hold forth a great deal of promise, and among the new engines our pre-eminent position established with the turbojet has been furthered with the medium-powered turboprops, Mamba, Dart and Naiad.

Operationally, considerable advances have been made as evidenced by but two, totally dissimilar, events—the Atlantic flight by Vampires and the Berlin air lift; whilst, commercially, the orders placed on behalf of B.S.A.A. for the large Saro boat and for the attractive Sealand amphibian, together with the inauguration of Solents on B.O.A.C. routes, suggests that the web-footed section of British aviation is not so moribund as many would have us believe. In the research branch of commercial aviation, B.E.A. have contributed usefully with their exploration for clear air gusts and with the initiation of the mail-carrying helicopter trials.

His Majesty presented colours to the R.A.F. College, Cranwell, in July.

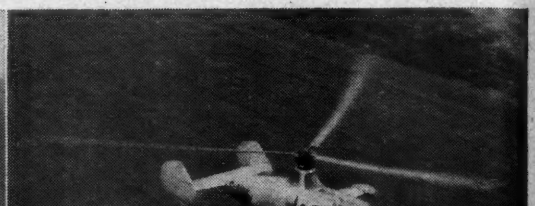
H.M. the Queen, with Princess Margaret, took great interest in the activities at the Northern Heights Gala in June.

In making this survey of the year's activities in chronological order, we intend here to touch briefly on some of the more interesting aspects, leaving the more detailed recollections to appear in their specific sections.

January saw the first structural detail release on the Saunders-Roe S.R. 45 flying boat, and also the inception of flight trials on the AW 52 Flying Wing. The Swedish Air Force placed an order for de Havilland Vampires; the magnificent Hodgson-Cuthbert collection of rare books, prints, drawings, etc., was presented to the Royal Aeronautical Society by Sir Frederick Handley Page, and preliminary details were released on the A.V. Roe (Canada) Chinook turbojet. At the close of this month, the whole aeronautical world mourned the death of Orville Wright.

In February we had first details of the Fairey Primer

The Ghost-Vampire holds the altitude record, and the 108, holds the 100 km. closed-circuit record and is the first British aircraft to have flown at above the speed of sound.



The Fairey Gyrodyne, with its unique configuration, broke the world's helicopter speed record on June 28th, at a speed of 124.3 m.p.h.

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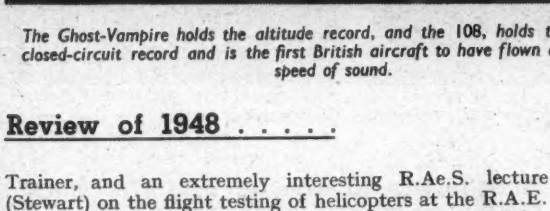
Trainer, and an extremely interesting R.Ae.S. lecture (Stewart) on the flight testing of helicopters at the R.A.E. The Marconi Company introduced a new range of light-weight radio equipment, and the marooned keepers on the Wolf Rock Lighthouse were supplied with rations by a Westland Aircraft, Ltd., S-51 helicopter. The all-through,



In April, the excellent cross-bar pattern of landing approach lights was demonstrated at Farnborough.

all-weather pilot training scheme was initiated for the R.A.F., and the R.A.E. Technical College was opened.

We reported on the North Atlantic flight-refuelling trials in March, and also on the training and research flight into Arctic latitudes by E.A.N.S. Lancasters. The Mamba turboprop was fully unmasked, and the Ministry of Civil Aviation laid down recommended standard instrument approach and holding procedure for SBA, ILS, BABS landing-aid systems, etc. Professor Lickley gave a valuable lecture on aircraft design procedure before the R.Ae.S., and this was complemented by an equally interesting lecture (Davies) on high-speed flight research. Toward the end of the month, John Cunningham regained for Britain the world's altitude record by taking the D.H. Ghost-Vampire up to 59,492ft.

Flight trials of the Gloster Meteor 7 trainer were initiated in April, and a further triumph for de Havillands was the raising of the 100 km closed-circuit record to 605.23 m.p.h. by John Derry in the D.H. 108. Both the Avro Athena and the Gloster E. 1/44 were described, and the new B.O.A.C. marine air terminal at Southampton Docks was opened. The month closed with a demonstration of a first-class idea, the new cross-bar pattern landing-approach lights devised and installed at the R.A.E.

In May, the first of a batch of Vampires for the Royal Norwegian Air Force were flown from Hatfield to Oslo, and a new two-channel VHF communications system for light aircraft was introduced by E. K. Cole and Company. Blackbushe was made available by the M.C.A. as an emergency FIDO landing field; further, B.O.A.C. opened its Solent service to South Africa.

In our June 3rd issue we announced the £100,000 award to A. Cdre. Sir Frank Whittle for his pioneer work in jet propulsion, and also reported the work of T.R.E., Great Malvern; the Wilbur Wright lecture was delivered by Mr. Arthur Gouge, who gave an admirable survey of aircraft size in air transport. Late in the month, details of the Vickers stratosphere chamber at Weybridge were released, and a convincing demonstration of crop-spraying by helicopter was given.

On June 20 H.M. the Queen attended the Northern Heights Model Flying Club Gala and presented the first Queen's Cup; the international air rally organized by the Royal Aero Club at Gatwick was a great success, and the appointment of Dr. H. Roxbee Cox to the position of Chief Scientist to the Ministry of Fuel and Power was announced. The first British national record for helicopters, and the international (Class G) record were established at 124.3 m.p.h. on June 28th by S/L. Arkell, with the Fairey Gyrodyne, and on the following day the now-famous Berlin air lift was started.

The tonnage lifted, frequency of service, traffic control

The Armstrong Siddeley Mamba, successfully concluded a 500-hour endurance test during September.

organization, maintenance and servicing, and the ground handling aspects of this stupendous operation, all must have an extremely valuable effect on the operation of transport aircraft, whether military or civil. The maintenance of flights during QBI conditions, and the high number of aircraft movements per hour, augur very favourably for the time when the fast turboprop and turbojet aircraft will have to be handled at our Metropolitan airports.

After some delays waiting for propitious weather, the six Vampires of No. 54 Squadron made their successful flight from Odiham to Montreal in the early part of July. The logical but unorthodox Planet Satellite aircraft was described, as was the work of the B.E.A. Gust Research Unit at Cranfield. The *Daily Express* Air Pageant at Gatwick excited considerable public interest, whilst Vickers Armstrongs gave the *débuts* of two extremely interesting aircraft, the Dart turboprop-Viscount and the Nene turbojet-Viking, the latter aircraft commemorating the 39th anniversary of Blériot's cross-Channel flight, with a flight to Paris and back at an average speed of 394 m.p.h. British gas turbines re-emphasized their quality with the successful completion of a 500-hour endurance test by the Bristol Theseus turboprop, and the full A.R.B. approval for civil operation by the D.H. Ghost turbojet. The S.R/A1 twin-jet fighter flying boat was described at the end of the month, and a review was also given of activities at the Atomic Energy Research Establishment, Harwell.

Much-needed supplies were delivered to the Wolf Rock Lighthouse in February by a Westland-Sikorsky S-51 helicopter.

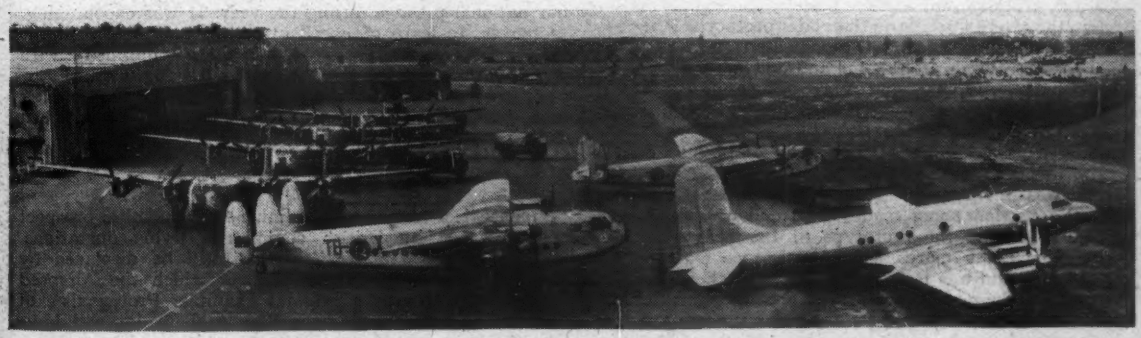
In August we published detail descriptions of the Naiad turboprop, the Prince feeder-class airliner and the Apollo medium-range airliner. Mention was also made of the use by Transport Command of two Avro Lincolns powered with Theseus outboard and Merlin inboard engines, and the month wound up with the Lympne meeting, in which the women's 100-km closed-circuit international record was broken by Miss Lettice Curtis, with the speed of 313.2 m.p.h. in a Spitfire II.

Undoubtedly the most important event in September was the S.B.A.C. exhibition at Farnborough, but, aside from the limelight attendant upon this universally interesting *concours*, there were many other aeronautical highlights. The Mamba turboprop successfully completed 500 hours' sealed running for the A.R.B., and the Goblin also completed more than 500 hours' running in 234 test cycles. Important air exercises between Bomber and Fighter Commands were held, and the new enlistment programme for R.A.F. aircrew was announced. On September 6th, John Derry flew the D.H. 108 at above the speed of sound—a magnificent achievement. Among the interesting aircraft which were dealt with in September were the Hermes IV and the Youngman-Baynes, the latter being specifically designed for research into high-lift problems. Mr. Peter Masefield gave his now-famous 16-point (1948 British Commonwealth and Empire) lecture, *Some Economic Factors in Civil Aviation*, before the Royal Aeronautical Society. Then, on the last day of the month, a message from the Lord Mayor of London was delivered to the Mayor of Paris in a lapsed time of 46 minutes 29 seconds by means of a Gloster Meteor and Bristol and Sikorsky helicopters.

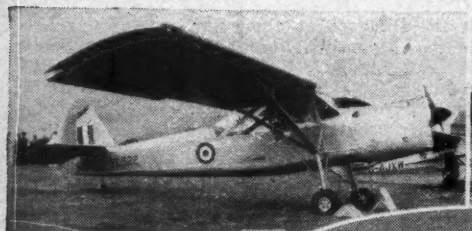
One of the first events of October and, although unspectacular, of tremendous ultimate significance, was the announcement of the acceptance of a recommendation to standardize U.S. and British screw threads. The inauguration of R.A.F. parachute medical teams was also made public. An announcement of considerable interest was that by the Royal Aeronautical Society deciding that divisions of the Society should be initiated in Australia and New Zealand. The smallest British helicopter, the Cierva Skeeter, first flew in October, and a new electrically actuated gyro horizon was announced by the Sperry Company. Of the new range of Blackburn Cirrus engines, the Bombardier was described in detail and was first flown. On October 18th the original Wright biplane, which had reposed since 1928 at the Science Museum, South Kensington, was handed over to the American Civil Air Attaché for return to the Smithsonian Institution.

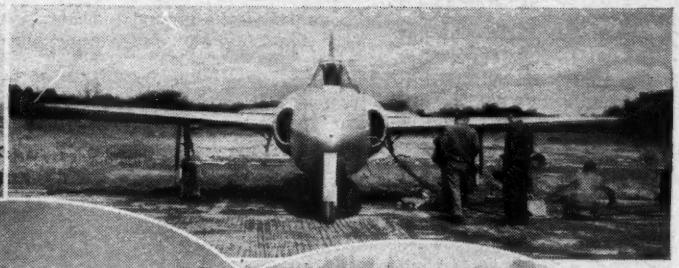
Our first issue in November reported the highly successful R.Ae.S. Conversazione at the Science Museum, and also included first details of a new Smiths instrument to show actual and maximum safe air speeds. An interesting development applicable to the field of marine aviation, the Hook Hydrofin, was also divulged during November, and the joys of ballooning were revived at Cardington, on the occasion of a visit by M. Charles Dollfuss.

This last month, December, has seen the first flight of the Cierva Air Horse, the largest helicopter in the world, and also experimentation with equipment for landing helicopters at night. Some revealing details on the servicing organization behind Transport Command's Berlin air lift effort were also given in the earlier part of the month, in addition to some of the principal features of the Rolls-Royce Dart turboprop unit. A lecture of more than ordinary interest on the development of a new aircraft

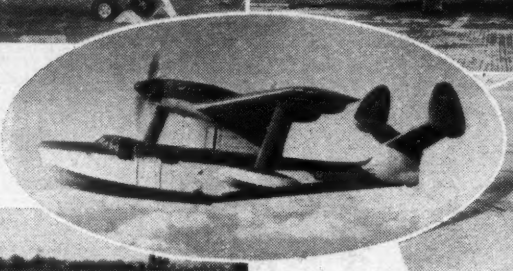


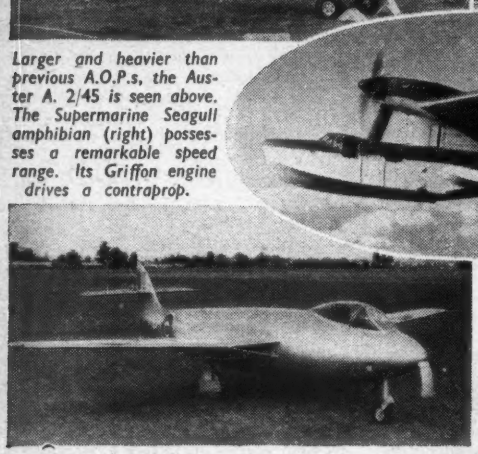
On June 29th, the delivery of supplies by air to beleagured Berlin was started, since when, the momentum has steadily increased to its present extraordinary capacity. R.A.F. Transport Command, the U.S.A.A.F., B.E.A., and several charter companies are all taking part.





Larger and heavier than previous A.O.P.s, the Auster A. 2/45 is seen above. The Supermarine Seagull amphibian (right) possesses a remarkable speed range. Its Griffon engine drives a contraprop.





Hawker's P.1040 (left) is a stable-mate of the Navy's N.7/46.

The Gloster E. 1/44 (top right) did not appear in public during the year. This type will be utilized for high-speed research. Below it Prince Bernhard and Bill Waterton are seen in the Meteor 7 two-seat trainer, which frequently distinguished itself.

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(Edwards) was given before the Royal Aeronautical Society, and the air/sea exercise "Sunrise" revealed a gloomy picture of operational ability. The amalgamation of General Aircraft, Ltd., and Blackburn Aircraft, Ltd., was announced, and it was also learned that flight trials have started in Australia with a glider employing a Griffith-type suction wing.

Looking back over the year's doings, one can reflect that a good deal of solid worth has been achieved; and the augury for the year ahead is thereby the brighter.

MILITARY AIRCRAFT

HEALTHY evolution, rather than spectacular novelty, has marked the Old Year in respect of Service aircraft.

After twelve months, the "paper performance" of Britain's standard fighters may be little improved, but that their operational qualities have benefited was made abundantly clear at Farnborough in September. The D.H. Vampire, in its new short-span, fighter-bomber form, proved itself an incredibly agile weight-lifter (a small fighter with twice the bomb load of the Blenheim!) while the range and endurance of the "homesick angel" Gloster Meteor intercepter were further extended. Hawkers were busy developing their beautiful P.1040 and N.7/46 prototypes, both of which may truly be said to have built-in endurance, and in addition they were working on their later prototype P.1052—also Nene powered. Glosters instrumented an E.1/44 for a high-speed research programme and delivered the first of their Meteor 7 trainers, and Vickers-Supermarine began to think of the Attacker more as a production job than as a pioneer 600-m.p.h. prototype.

Equipped as a bomber, the rugged, adaptable, Bristol Brigand was delivered in quantity to the R.A.F. The Avro Lincoln was increasingly issued to Bomber Command units, one version being modified to deliver super-heavy bombs. Meantime the prototype of the heavy Griffon-engined Shackleton maritime reconnaissance machine for Coastal Command was receiving finishing touches.

Transport Command took delivery of four-engined Handley Page Hastings and twin-engined Vickers Valettas as replacements, respectively, for the York and Dakota, and to-day the R.A.F. can boast, in the Hastings, a capacious and proven trooper/freighter with the speed of an early Spitfire. Towards the year's end, the Valetta was further developed as an operational trainer, to succeed a version of the Wellington. Thus, by the time the Boulton Paul Balliol or Avro Athena trainers are in service (comparative trials of piston-engined versions, to determine which shall be standardized, are imminent) they will be matched by modern "O.T.U." equipment. Regarding the *ab initio* and "basic" branches of the trainer tree, the Percival Prentice (already in service), the D.H. Chipmunk and the Fairey Primer were keenly rivalling each other for greater national and international recognition of their peculiar qualities. What might be construed as vacillation in deciding upon a Tiger Moth replacement may have arisen from *embarrasse de richesse*.

The presence at Farnborough of the Supermarine Seagull variable-incidence amphibian (ex-spotter reconnaissance; now air/sea rescue); and the new Auster A.O.P. monoplane, suggested that specialist requirements of the Royal Navy, the R.A.F. and Army, are not being overlooked, despite concentration of interest and funds in fighters and bombers.

Behind the scenes, research flying programmes went forward, utilizing such aircraft as the AW 52 Flying Wing (a Derwent-powered version of which appeared in time to perform at Farnborough), the D.H. 108, the special high-altitude Ghost-Vampire, the Avro Tudor VIII, and the Nene-Viking, all of which have given a decided fillip to our national prestige during the year. It was encouraging, moreover, to learn of excellent results achieved with the little Youngman-Baynes monoplane, equipped with experimental high-lift devices, and with the General Aircraft research gliders. Vickers transonic air-launched models and free-falling aerodynamic bodies further enriched Britain's mounting store of technical knowledge.

CIVIL AIRCRAFT

THERE is a tangible silver-lining to the sombre prospect presented by British commercial flying operations. Gradually, the "interim" aircraft will be displaced by machines of outstanding calibre, of which the Airspeed Ambassador is such a brilliant example. Protagonists of the four-engine formula (the first Ambassador will have two Centaurus piston engines) were to some degree confounded by Mr. Errington's memorable Farnborough expo-

Review of 1948 . . . . .

sition of the Ambassador's amazing aerodynamic qualities. The Vickers Viscount—in certain respects a more advanced, and exceptionally safe design, having four turboprops—dropped out of the running for Corporation orders, but proved a delightful harbinger of the "turboprop transport" era.

Though rightly publicized as "jet airliners," the Avro Tudor VIII and Vickers Nene-Viking are considered by their sponsors—the Ministry of Supply—as pure-research machines. They will strengthen the foundation of experience upon which such types as ultra-fast D.H. Comet, with its four Ghost turbojets, must stand before they enter service.

The Handley Page Hermes IV, 25 of which are earmarked for B.O.A.C., made an impressive début at Farnborough, and will be followed by the even more efficient Mk VI. In the Armstrong-Whitworth factory, the attractive form of the four-Mamba Apollo gradually took shape throughout the year. At last, the Brabazon I saw daylight at Filton and, all questions of operational efficiency aside, showed itself (as proved by new photographs in this issue) to have classic beauty of line. Its first flight during the New Year will be a milestone on the adventurous road to British pre-eminence in aerial commerce. Less spectacular, but a real tribute to those responsible for engines, airframe and airscrews, was the Bristol New Type 170, offered during the year.

Typifying recent progress in what, for want of a more concise term, may be called the "charter" field, the Percival Prince and the Short Sealand amphibian attracted a steady flow of enquiries from home and overseas. Their designers have done wonders in translating the ephemeral and often conflicting specifications of operators into practical and outstandingly attractive vehicles.

While "The Clubs" have been persevering with ageing equipment, such desirable light aircraft as the Chrislea Super Ace and Auster Avis have been perfected, while the first flight of the unorthodox Planet Satellite pusher monoplane has drawn closer.

Especially encouraging have been the great forward strides in the development of rotating-wing aircraft. The speed record established by the Fairey Gyrodyne speaks for itself. Westland's S-51 has offered abundant evidence of its practical possibilities, and the Bristol 171 Mk I, itself highly successful, gives but a foretaste of the remarkable efficiencies promised by later and larger models. The ponderous Merlin-engined Air Horse was airborne late in the year, contrasting amazingly with the 1,200-lb. two-seater Skeeter, from the same (Cierva) stable.

On no more promising a theme could this cursory stock-taking of Britain's aircraft for 1948 be concluded.

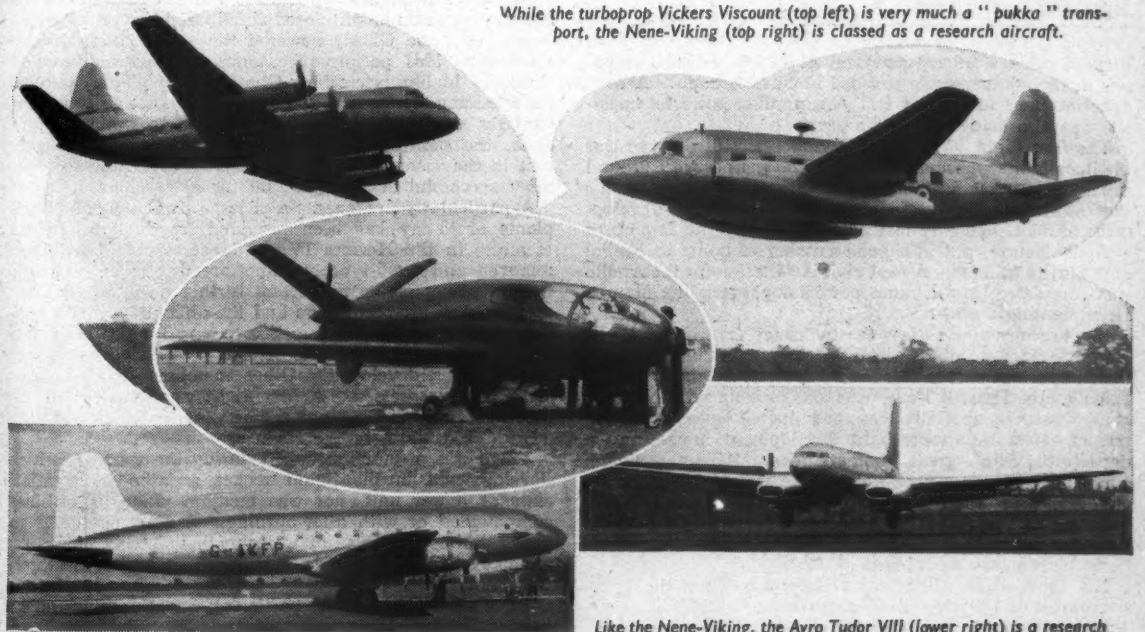
POWER UNITS

CLEARLY woven in the power unit progress pattern of the past year have been two designs: the first, to prove the dependability of gas turbines in all their applications, and the second, to exploit the potentialities of turboprops in trainers and in new civil aircraft. Both are of the utmost importance not only in establishing more firmly the place of gas turbines in the civil as well as military field, but particularly because in the face of determined world aviation competition British experience and "know-how" with turbojets and turboprops are trump cards.

Producer companies, co-operating with the Ministry of Supply, undertook and without exception passed successfully a series of remarkable endurance tests The gas turbines concerned were the de Havilland Goblin, the Bristol Theseus and Armstrong Siddeley Mamba, all, of course, type-tested units. The first-named made 234 test cycles of 65 minutes' duration, simulating combat flights, followed by further test runs. The unit completed over 500 hours over a period of seven weeks, requiring only routine attention. The two turboprops each completed 500-hour "sealed" test runs, again receiving only scheduled inspection. The Mamba test was made up of 34 five-hour and 33 ten-hour runs. For the Theseus the schedule included 67 starts and five hours at maximum take-off power. The 500 hours' running was completed in 567 hours' elapsed time.

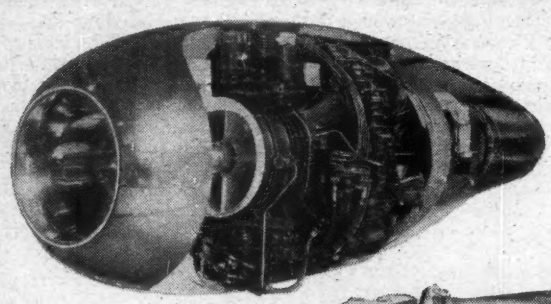
Some details of the Bristol Proteus became known during 1948, and good progress was made with this all-important future power unit of the Brabazons. Rolls-Royce gave a

While the turboprop Vickers Viscount (top left) is very much a "pukka" transport, the Nene-Viking (top right) is classed as a research aircraft.

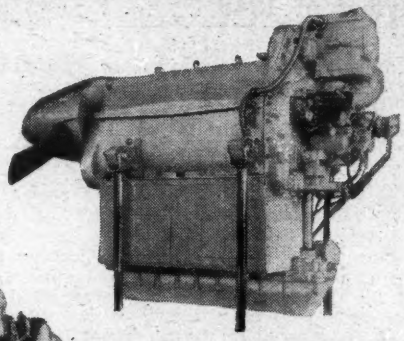


Outstanding among the world's light aircraft, the Planet Satellite (centre) was completed, but not flown, during the Old Year.

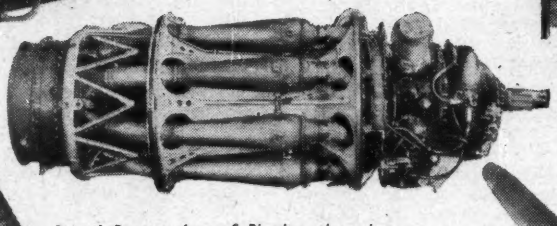
Like the Nene-Viking, the Avro Tudor VIII (lower right) is a research aircraft. It has four Nenes and will be the instrument of investigation into high-altitude transport operations. On the left is the very handsome Handley Page Hermes IV, adopted by B.O.A.C.



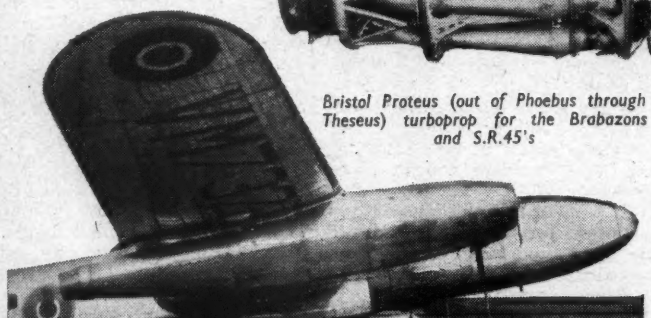
D.H. Ghost power plant with anti-icing equipment. This is a civil development.



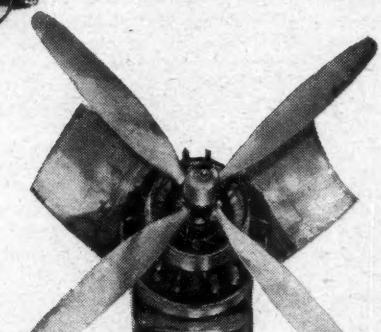
Type-tested and airborne for the first time in a Messenger, the Cirrus Bombardier has progressed rapidly in 1948.



Bristol Proteus (out of Phoebus through Theseus) turboprop for the Brabazons and S.R.45's



Long and slim Rolls-Royce Avon nacelle in its Lancastrian test bed. Avon and Tay are the latest high-power turbojets to be announced.



Opened up for inspection is one of the Hercules 763s for the Hermes IV.

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surprise preview of two powerful A.J.65 Avon axial turbojets in their Lancastrian test-bed at Farnborough. A bare announcement of the Tay R.T.A.1, another powerful turbojet, was also made late in the year.

The first flight of a pair of Pythons is still delayed but the installation was completed, and the engines were ground run. Any other installations must await the test-bed's successful first flight. In contrast, the Mamba, development of which recently formed the subject of an important R.Ae.S. lecture, put in a good number of hours in Balliol and Athena trainers. A neat civil installation for the Apollo was completed, and a more powerful version, the Mamba II, is running.

In the same power class the two-stage centrifugal R.-R. Darts, four of which are installed in the Viscount, played their important part in this highly successful debut. A new 1,400 b.h.p. Dart, R.Da.3, was also announced. Napier's Naiad, with a specially designed ducted spinner intake, put in some important flight development hours, and a departure with great potentialities, "Siamese-style" coupled Naiads, are now well on the way. An attractive civil Naiad installation appeared at Farnborough.

Metrovick Beryls, fully rated, were installed in both an S.R/A.1 and a Meteor. In the latter case a startling climb performance was recorded.

No doubt 1948 will also be remembered for the introduction of large pure-jet aircraft—in particular the Nene-Viking and the Tudor VIII for research. The twin-Nene-powered A.W.52 flying wing was joined by a Derwent V version. Witness to the prestige of the Nenes is borne by the licensing agreements with France and America.

In the record field an up-rated Goblin III in the D.H.108 featured in the 100-km closed-circuit flight, and its larger stable-mate, the Ghost, powered the special high-altitude Vampire. This performance, considered in conjunction with the highly interesting Ghost power plant complete with de-icing arrangements, seen at Farnborough, was particularly significant and praiseworthy. In quite another class, the performance of the Alvis Leonides helicopter unit in the record-breaking Gyrodyne bore witness to another successful development in this new sphere.

A particularly fine example of large piston-engine power plants of to-day has been provided by the four Bristol Hercules in the Hermes IV. All excresences have been removed and petal-type cowlings are fitted. Rolls-Royce Griffon power plants underwent further development.

In spite of pre-occupation and the difficulties which confront private flying, it was an active year for small engines. Gipsy Queen and Major X power plants with v.p. airscrews were further developed. Other members of the Major series also progressed. A first flight was made lately by the Blackburn Cirrus Bombardier, smallest of a new and advanced series of in-line engines.

There was no announcement during the year of British developments in the liquid rocket or athodyd (ramjet) class of power unit, nor was mention made of turbines compounded or with after-burning. A Dart, up-rated in power through the use of water-methanol, was, however, announced. Avro Canada announced their first turbojet, the Chinook.

Details which received particular attention during the year were single-lever power controls for turboprops (particularly those with axial compressors) and combustion chamber design. Lucas studied a new annular combustion chamber, and Armstrong Siddeley had considerable success,

particularly in A.S.X. relighting at altitude, with their vaporizing chamber, for which a licence agreement has been concluded by America. It is more than probable that all small civil turboprops will carry ducted spinners. The problem of anti-icing gas turbines continued to receive attention, and concern regarding the availability of sufficient quantities of paraffin for gas-turbine fuel was expressed in some quarters.

Overall, power plant progress continued to be most satisfactory, and to represent one of the most encouraging aspects of the country's aviation effort.

CIVIL FLYING

OUTSTANDING achievements in commercial operations have perhaps been rare in 1948 but the year has been one of changing circumstances, decisions and fortunes. The year opened with the knowledge that B.E.A. were to re-equip with Ambassadors in about 1952, and although the order was not signed until many months afterwards a full first year of development and co-operation between manufacturer and user can be reported. The large deficits of all three Corporations are apt to cast a gloom over the general picture of British airline operation, and in that connection each Corporation has had an unsettling time in attempting economies. B.O.A.C. reduced staff along the routes and at home, and B.E.A. made similar efforts to cut down overheads, but the increase in traffic during the summer months made the situation complicated. B.S.A.A. on the other hand started operating Tudor IVs and some expansion resulted. Sir Miles Thomas was brought in to B.O.A.C. as Deputy Chairman with the special assignment of executing economies, and later in the year Lord Douglas replaced Lord Rothschild on the Board.

Solent flying boats were introduced on the South African route in May and withdrawn shortly afterwards for modifications, but services were resumed in the autumn. Flying-boat services have continued on routes to the Far East but the purchase of five Constellations from Aer Lingus in May caused a change in policy to lead to the eventual substitution of Constellations for flying boats on the Kangaroo route to Australia.

Early in the year B.O.A.C. carried out flight refuelling tests on the North Atlantic route from which considerable important data were gathered for the benefit of subsequent refuelling operations, perhaps involving even the Brabazon I.

High utilization of the Constellations on the North Atlantic route was again a feature, and during the summer six services a week were flown between London and New York and three between London and Montreal. At the same time the New York-Bermuda Constellation service was increased to four round trips weekly, all with only six aircraft. In February a Lancastrian service was started to Colombo and Singapore and on 19th March the route to Japan was re-opened. A decision which met with mixed feelings in this country was the order for 22 Canadair Fours, but it is hoped that when they are brought into service next year the Corporation will be in a position to operate with greater economy. Sir Frank Whittle was made Adviser to B.O.A.C. on the use of jet engines in civil aircraft, a significant appointment. As the result of close co-operation between Handley Page and B.O.A.C. the Hermes IV was fully equipped and it flew for the first time in September. There is every hope that B.O.A.C. will take delivery early in 1949, for development trials, the first of the 20 ordered. Encouraging news, came late in the year, that B.O.A.C. were to order 25 Bristol 175s for the Empire routes. These aircraft are, on paper, well ahead of the Constellations in performance.

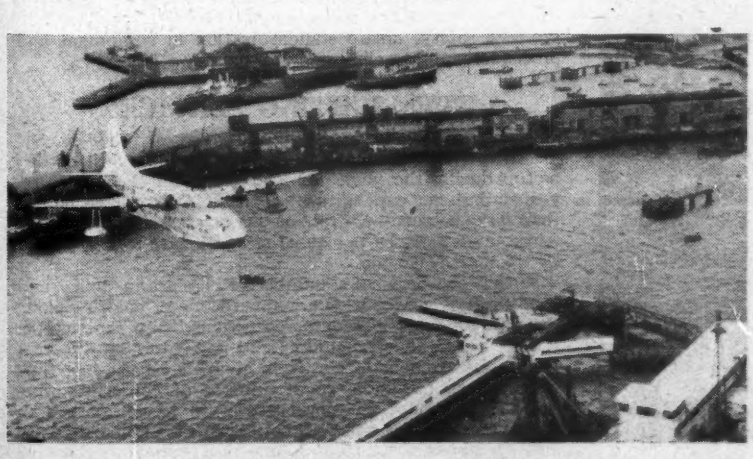
Lord Pakenham succeeded Lord Nathan at M.C.A.

British South American Airways ordered three Sealand amphibians for service on British West Indian Airways inter-island routes in the Caribbean area.

British European Airways made some interesting experiments in the delivery of mail by helicopters. The Corporation set up a special experimental unit which first of all flew dummy mails, to schedule, over a route in the West Country. The Unit then went to East Anglia to take over the collection and delivery of live mails in an isolated area. The Unit is continuing with the development of blind-flying and night-flying equipment for helicopters.

B.E.A. also formed a special unit for gust research which, equipped with two Mosquitoes, has carried out experiments on the usual European routes, at high altitudes, with a view to future high-speed over-the-weather operations. The Corporation has financial interests in several subsidiary companies operating overseas, but perhaps the most surprising development was the acceptance by the M.C.A. of scheduled flying by charter companies in association with B.E.A., on routes in the United Kingdom. This was agreed after B.E.A. found themselves unable to operate such routes economically.

When all seemed lost and the Government was about to abandon



A B.O.A.C. Short Solent flying-boat over the marine air terminal in Berth 50 Southampton Docks which was opened on April 14th.

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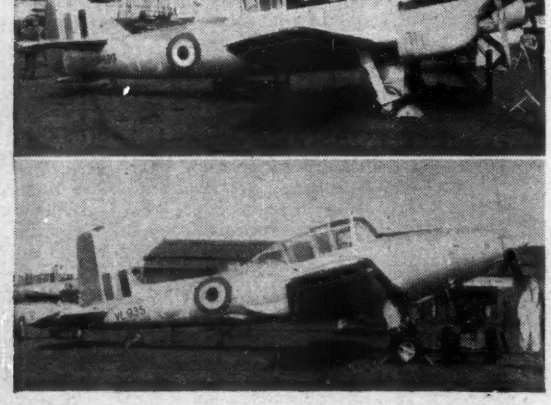
the S.R./45 flying boat, B.S.A.A. put up strong arguments in favour of operating it on the South American routes, and it was agreed that production should continue. This cause was taken up by the Chief Executive, the late A. Cdre. Brackley, after he had replaced A.V-M. D. C. T. Bennett. The Corporation suffered a great loss when A. Cdre. Brackley was drowned at Rio de Janeiro in the autumn. Soon after the S.B.A.C. show B.S.A.A. announced an order for three Sealand amphibians for operating between the Caribbean Islands. The Tudor was the subject of much controversy, particularly after the Courtney Committee report was made known in January; the position became easier during the year, however, and B.S.A.A. stil have plans to operate some 24 Tudors modified to their own requirements. Modifications on one B.S.A.A. aircraft are now in hand for flight refuelling.

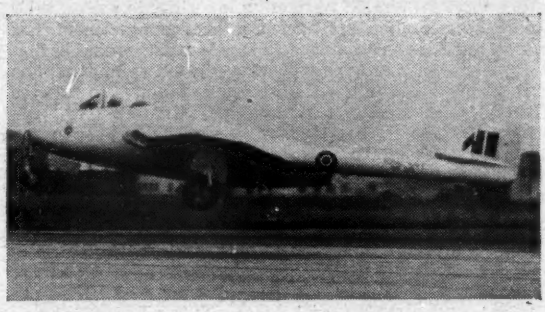
Charter companies suffered from the currency restrictions in Europe and also from the scarcity of suitable aircraft. Halton freighters have continued to do good business, but several operators feel that the time is not far off when a suitable replacement must be found. For passenger carrying the Dakota has done yeoman service, and several companies have expanded their operations with Vikings. Valuable pieces of machinery and ships' component parts, such as propeller shafts, have been carried by air and shown considerable economy over surface transport, to the charterer. Several charter companies joined the three Corporations in the air lift to Berlin. An important step was taken in the creation and consolidation of the air section of the Baltic Exchange, which has shown increasing activity. Aquila Airways, started operating this year with Hythe flying-boats purchased from B.O.A.C.

In June a new Minister of Civil Aviation, Lord Pakenham, succeeded Lord Nathan. He has demonstrated his interest in the many branches of civil aviation, but through circumstances beyond his control he has been unable to give more than sympathetic consideration to those which require active Government assistance. Services in Scotland, Wales and the possibility of assistance for flying clubs have all received and continue to be receiving his attention. A greater measure of air traffic control over London was introduced and has progressed throughout the year, and many new blind-flying and other facilities have been installed at London Airport including G.C.A. and special approach lighting.

Flying clubs have shown dogged determination in their efforts to keep going against the hardships of high costs,



The Merlin-engined version of the Avro Athena (top) and the Mark I Boulton Paul Balliol are shown. Other versions exist.



A D.H. Sea Vampire 20 of the Royal Navy is seen landing after one of several aerobatic displays at Idlewild, New York.

official regulations and the absence of subsidy. The Minister of Civil Aviation and the Secretary of State for Air received a deputation from the Association of British Aero Clubs which protested against the lack of official support for the flying clubs. A case was made early in the year for abolishing the aviation fuel tax of 9d per gallon, a measure which would have assisted clubs, charter companies and British airlines alike. All over the country throughout the summer season flying clubs have staged displays, rallies and "at homes" in which the degree of enthusiasm was highly promising and indicative of the potential support for club flying if circumstances were improved. Two full-size public displays were staged at Lympne and Gatwick.

In December the report of a committee formed to enquire into accident investigation procedure was published. As a result Lord Pakenham has made important changes in accident investigation procedure, especially with those points on which criticism had been focused. He would not give way, however, to the criticisms which had involved his own Ministry. He was unable to agree that there was any difficulty in the Minister being an interested party in accident investigations involving British airline corporations or the organization at M.C.A. airports.

In April the airline pilots of 16 countries formed, at the instigation of B.A.L.P.A., an international federation with a view to being recognized on an international level and to press for pilot representation at International Associations.

The British corporations opened for the use of other airlines the school at Aldermaston for training air crew and ground crews. After several months, however, Airways Training Ltd. was closed down through lack of support. In the international sphere both the International Civil Aviation Organization and the International Air Transport Association have been active in committee in all regions of the world, and many recommendations have been made to promote safety, create standardization in equipment and procedures, and to eliminate unnecessary regulations.

THE FIGHTING SERVICES

THE progressively dwindling allowance of funds for the armed forces inevitably lessened the strength of this nation during the year. In March the Air Estimates revealed that net expenditure on the R.A.F. was to be less than £173,000,000—a drop of £41,000,000 from the 1947 figure, and that the personnel strength was to be reduced by 45,000 to 370,000.

Within the Service, a number of changes in policy and conditions of service were announced, many pointing along the slow road to "peacetime conditions." In January the R.A.F. began to accept pilots and navigators on five-year regular engagements direct from civil life for the first time since the war, and a small number of conscripts were accepted for pilot training, subject to having served in the A.T.C., and attained school certificate standard. Also announced was the setting up of a new branch—the Marine Branch—for the command of R.A.F. vessels and Marine

(*Continued on page* 789)

HERE AND THERE

Aero Golfers

AT the annual dinner of the Aero Golfing Society held at Londonderry House on December 15th, Lord Brabazon, President for 25 years, was the recipient of a silver-mounted inkpot. Sir Frederick Handley Page was elected Vice-President.

Airwork in Pakistan

PAKISTAN AVIATION, LTD., Karachi, have signed a three-year contract with Airwork, Ltd., to become effective immediately, under which Airwork will act as technical consultants in the development of aircraft and engine overhaul workshops and also of a training school there. About 200 technical personnel are being sent to Pakistan.

Successful First Year

AT the first annual general meeting of Tiltman Langley Laboratories, Ltd., which was held on December 9th, the chairman, Mr. C. H. Roberts, A.I.Mech.E., F.I.M.I., reported that substantial progress had been made during the first year of the company's operation, and stated that the volume of work in hand at the close of the year was some six times greater than that of the original partnership of Tiltman and Langley which the company had taken over. Aeronautical engineering research will continue to be the main activity of the company, with special reference to certain aspects of de-icing, variable ratio gears, strength of structural materials and aircraft seating. Plans for the further expansion of the company's activities were favourably received at the meeting; Mr. A. Hessell Tiltman was unanimously elected to hold office as chairman for the ensuing year.

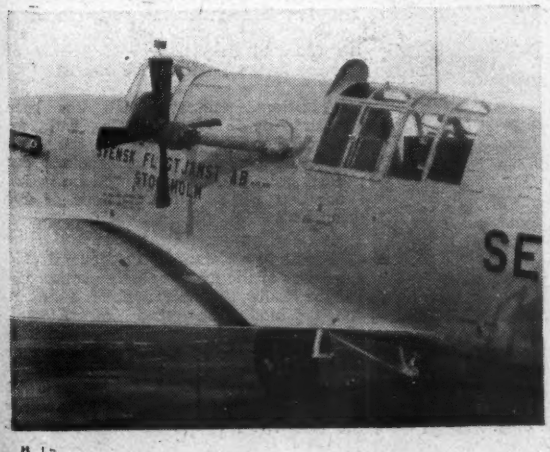
Recognition Society's Forum

THE December meeting of the Aircraft Recognition Society, held in the library of the Royal Aeronautical Society, took the form of a "Forum" composed of Mr. Charles Gardner, who took the chair, Prof. A. A. Hall, Mr. C. G. Grey and Mr. H. R. Gillman; Mr. Peter Masefield was unfortunately absent owing to illness. The board of experts dealt with some 17 questions which had been prepared by members of the Recognition Society. The Forum agreed that the Berlin Airlift was the most outstanding aeronautical event of 1948. Gas turbines, prop-jets and ram-jets were discussed and Professor Hall expressed his faith in the ultimate success of the pure jet turbine in the civil field, although Mr. Charles Gardner seemed to think the Forum could have been a little kinder to the prop-jet. Other questions dealt with "the perfect airfield," construction of fuel tanks related to fire risk, and the future of flying boats. The regular monthly spotting contest which preceded the Forum was won by Mr. J. S. Webb.

THE DUKE AT WOLVERHAMPTON: Photographed on the occasion of his visit to the Fischer Bearings Co. Ltd., at Wolverhampton, H.R.H. the Duke of Edinburgh is seen here with Mr. M. B. U. Dewar, chairman of the company, and the Mayor of Wolverhampton, making a close inspection of a sectioned Derwent V gas turbine, in the construction of which the company's products are used.

Birmingham Airport

IN a report issued on December 21st the Birmingham Junior Chamber of Commerce made a strong recommendation that Elmdon Airport should be ready to handle regular services before the opening of the next British Industries Fair. The report points out that Elmdon has cost the people of Birmingham nearly three-quarters of a million pounds in building and equipping it as a modern airport, and that its present disuse is a constant drain on their resources. The report further recommends that navigation and landing aids, preferably of an international type, should be installed immediately.



TOWING THE LINE: Some 7,000 ft of towline is re-wound by the windmill which distinguishes the Swedish target-towing version of the Fairey Firefly. The first of a batch of these machines was delivered recently.

Increasing Export Production

IN order to gain an increase in production the Chloride Electrical Storage Co., Ltd., recently adopted a suggestion put forward by the branch secretary of the workers' union at a Works Committee meeting. This was to approach the office staff and request their help in the factory by working side by side with the factory personnel during overtime. Following a discussion with the office staff 175 of these employees volunteered to work 2½ hours overtime in the factory for two or three nights each week. The experiment though naturally a temporary measure, has proved highly successful and the management of the Exide Works, who selected jobs for which the volunteers would require little or no training, report that, apart from the benefit to the production drive for export, an increased mutual respect and friendship has resulted.

Renfrew Foundries Sales Areas

REORGANIZATION of the sales arrangements of Renfrew Foundries, Ltd., has been undertaken in order to improve further their contact with industry. Each of five areas, covering England, Scotland and Wales, is now under the supervision of a qualified foundry sale engineer. Mr. R. McGlashan, Renfrew Foundries, Hillington, Glasgow, S.W.2, is in charge of the Scottish area; Northern England is under the supervision of Mr. A. J. Hebden, 41, Nab Wood Crescent, Shipley, Yorks. Mr. J. A. K. Fergie, the Leys, Adderbury, Banbury, Oxfordshire, is responsible for sales and technical problems in the Midlands and Wales, and the company's representative for south London and southern England is Mr. J. S. Thompson, 53, Tudor Way, Hillingdon, Uxbridge. The fifth area,

HERE AND THERE

North London and the Eastern Counties, is covered by Mr. E. P. Mendoza from 16a, Green Court, Green Lane, Edgware, Middlesex.

Navion Over the Andes

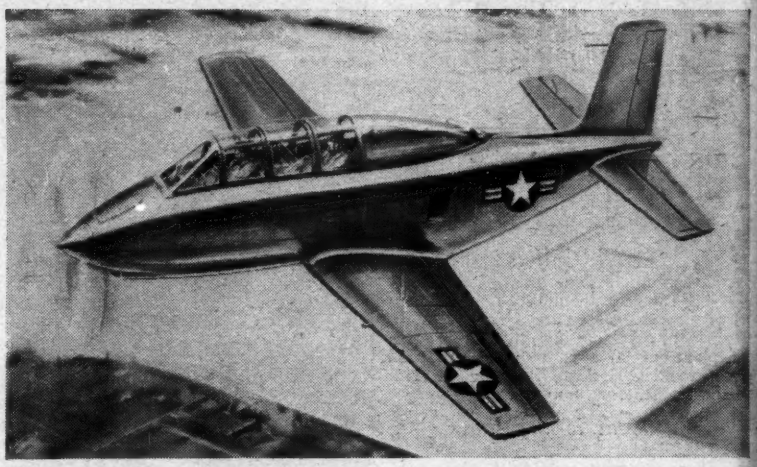
ALTHOUGH several Ryan Navions have made flights from the U.S.A. to South America along the East Coast route the first flight by one of these four-seater light aircraft along the West Coast route was made recently by Mr. B. Dardel, a member of a Swiss exporting firm. In spite of only 200 hours' experience Dardel successfully completed the 10,000 miles flight from San Diego, California, to Buenos Aires which included crossing the Andes 70 miles east of Santiego, Chile.

Glider Rescue Attempts

FOLLOWING a crash of a Dakota on an ice-covered mountain slope in Greenland at an altitude of over 7,000ft, attempts were made to rescue the airmen by means of a glider. The glider was towed to the place of the accident by air, cast off and landed to pick up the stranded airmen. The first two attempts at a "snatch pick-up" of the glider by its tug resulted in the glider nosing over on the rough frozen surface. After removing the wheels a third attempt resulted in the glider becoming airborne but when only 50ft up the tow-line broke and it had to descend.

Air Scout Show

THE twelve London troops of the Air Scout Movement are holding an exhibition on Saturday, January 22nd, at Holloway Baptist Church, Holloway Road, N.19. The exhibition opens at 3 p.m. by A. V.-M. S. E. Toomer, C.B., C.B.E., D.F.C. During the evening a talk will be given by Mr. Scott Chard and films connected with aviation will be shown. Membership of the Movement in the London area now numbers about 350, and interested enquiries should be addressed to Mr. K. H. Crout, 68, Elizabeth Avenue, Islington, N.1. This is the first exhibition to be held in London by the Air Scouts, a branch of the Boy Scouts' Association.



BACKS TO THE ENGINE PREFERRED: An interesting approach to the problem of basic trainer layout is provided by the Douglas XT-30. An in-the-middle power unit moves the c.g. rearwards so that the tandem cockpits can be ahead of the wing for good all-round view.

Safety Campaign

AS part of their campaign to promote air safety among users of their aircraft, the Beech Aircraft Corporation have published the first issue of *Safety Suggestions*. Published as a service for pilots, this folder is now being sent direct from the Beech factory at Wichita, Kansas, to the entire Beechcraft owners list. The first issue of the pamphlet deals with the dangers of ice, frost and snow on the upper surface of wings and warns pilots to make sure that in cold weather such frozen surfaces have been cleared of ice before taking off as, according to the booklet, the minimum flying speed of a wing can be doubled by even a semi-transparent layer of fine snow or hoar frost. Further warnings are given, with impressive illustrations, of the damage that can be caused by colliding with birds in the air, and pilots are recomended to land after such a collision as soon as possible to inspect the damage.

News in Brief

DURING a week before Christmas mail handled by B.O.A.C. at London Airport reached the record figure of 109 tons. The Southampton Marine terminal of B.O.A.C. handled 50 per cent more mail than usual; over half of this was for Hong Kong.

Vice-president of United Helicopters, Inc., of the U.S.A., Mr. A. J. M. Chadwick will be in London from January 1st. During his stay appointments can be made with him at the offices of Sponson Developments, Ltd., 3, Albemarle Street, London, W.1, and letters may be addressed to him there.

* * *

The number of vice-presidents of the Ultra Light Aircraft Association has, with the recent acceptance of this office by Major Frank Halford, now been brought up to six.

* * *

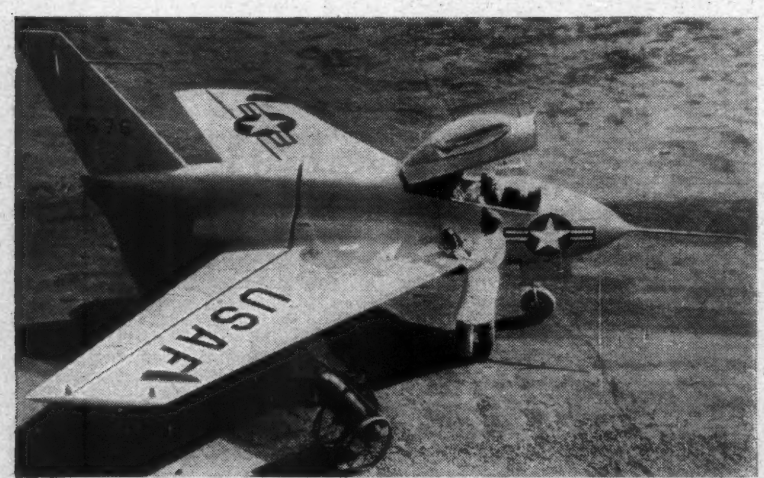
A party of Polish officers, members of the Polish resettlement corps in England, recently flew in a chartered aircraft to Karachi; they have volunteered for service in the Pakistan Air Force.

* * *

Additional factory space has been acquired by S. Wolf and Co., Ltd., for the further development of the Wolf range of portable electric tools. The additional space at Acton will be in full operation within the next four or five months.

* * *

Formerly assistant to the general sales manager of the manufacturing companies of the Rootes Group, Mr. E. M. Saunders has joined the staff of Electro-Hydraulics, Ltd., Warrington. As sales manager of their industrial division he will be in charge of sales promotion of the "Conveyancer" range of fork lift trucks and associated material handling equipment.



AMERICA'S "108": Suggesting reverse lease-lend, in that its aerodynamic design bears a strong resemblance to that of the D.H. 108, the Northrop X-4 trans-sonic research aircraft is seen at Muroc, where it lately made its first flight, lasting 18 minutes. It will be gathered that twin axial-flow turbojets are fitted, whereas the 108 has a single Goblin. Note the small fins on the wing, presumably to control boundary layer drift.

H.M.A.S. Sydney in Devonport Dockyard.

Australia's First Carrier

Consolidation of Sea Power in the Pacific

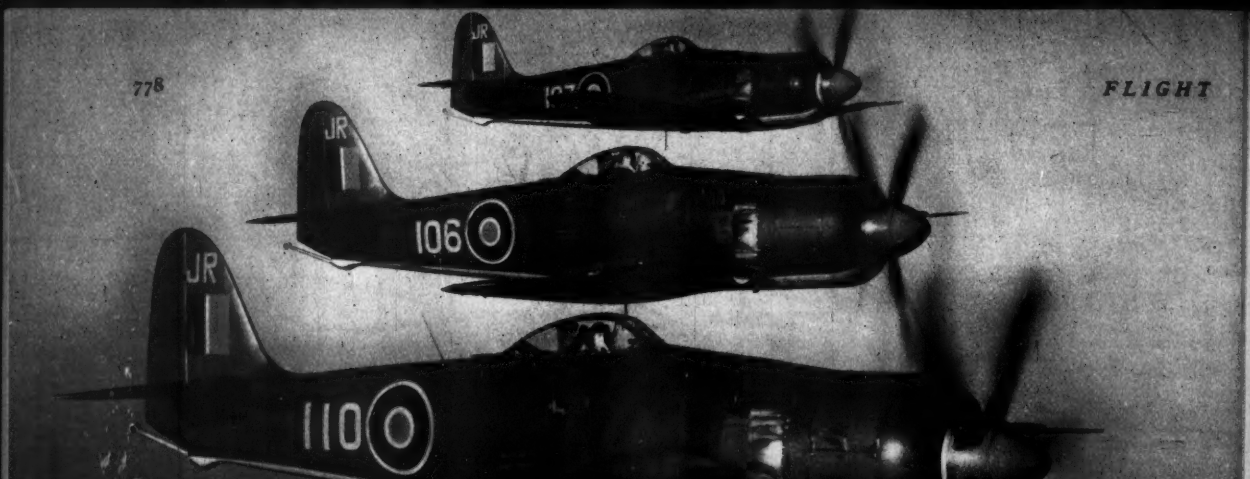
OF factors to be considered in the estimation of a nation's strength, few are more significant than entries under the heading "Naval Aviation." It is therefore reassuring to observe that the Commonwealth of Australia's decision to establish an Air Arm for the Royal Australian Navy has now been partly fulfilled by the transfer to that service of a light fleet carrier of the *Majestic* class. The acquisition of a second carrier, H.M.A.S. *Melbourne*, is expected during next year.

At Devonport, on December 16th, the First Lord of the Admiralty, Viscount Hall, performed the official ceremony of handing over H.M.S. *Terrible* to Australia; the ship was accepted on behalf of the Commonwealth by the Rt. Hon. Mr. J. B. Beasley, High Commissioner for Australia. Mrs. Beasley then renamed the vessel H.M.A.S. *Sydney*, making it the third ship of the Royal Australian Navy to have borne this name.

Captain Dowling (right) and Commander Becher of the Sydney

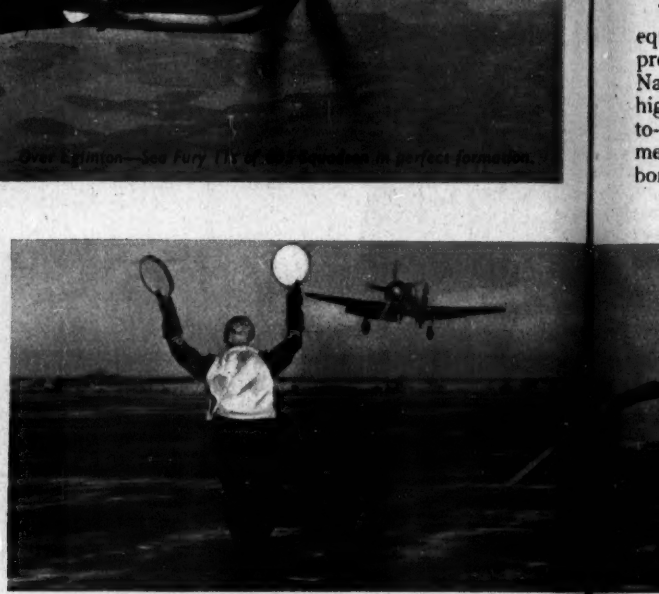
The *Sydney* is one of six light fleet carriers of the *Majestic* class (standard displacement 14,000 tons) which have been launched; a sister-ship is the *Magnificent*, which is on loan to the Royal Canadian Navy. Viscountess Astor laid the first keel plate in H.M. Dockyard at Devonport in 1943, and when launched on September 30th, 1944, the ship was named *Terrible* by Mrs. Duncan Sandys, daughter of Mr. Winston Churchill. H.M.A.S. *Sydney* was the first large ship to be completed specifically for the Royal Australian Navy, and the first carrier to be built at a Royal Dockyard.

It is officially stated that experience gained with earlier carriers in the closing stages of the Pacific war has resulted in many improvements in the design of the ship. The peacetime complement of approximately 1,100 officers and men will benefit from excellent ventilation, air conditioning and laundry equipment. Galley services are fully up to date, and for the ratings there is a cafeteria-type messing system. The only mention of armament refers to "30 small guns." The ship's turbines were manufactured by Parsons, Ltd.



Over Eglinton—Sea Fury IIs of 805 Squadron in perfect formation.

Keen model makers are among the Sydney's complement.



Dummy deck-landing of a Sea Fury, complete with "batsman."

Australia's First Carrier . . .

The carrier's chief cook seems satisfied with his galley.

The date of the *Sydney's* "emigration" has not yet been disclosed, but will probably take place when working up—due to begin next month—is completed. Aircraft to be embarked are the Sea Fury IIs and Firefly 5s of 805 and 816 Naval Air Squadrons. The two squadrons together comprise No. 20 Carrier Air Group, and with their transfer to H.M.A.S. *Sydney* will become a part of the Royal Australian Navy. Sixty per cent of the present aircrews are members of the R.N., as are the Air Group's Commander, Lt. Cdr. P. C. Whitfield, and the commanding officers of the squadrons—Lt. Cdr. P. E. I. Bailey, of 805 Squadron, and Lt. Cdr. C. R. J. Coxon, of 816 Squadron. Training of the Group has lately been in progress at Eglinton, in Northern Ireland.

Captain of the Sydney is an Australian, Capt. R. R. Dowling, D.S.O., A.D.C., R.A.N., but on the flying side, the ship's senior officers are all from the Royal Navy. Commander (Air) is Cdr. R. J. H. Stephens, and the duties of Lieutenant-Commander (Flying) and (Operations) are allotted respectively to Lt. Cdr. B. E. Boulding, D.S.C., and Lt. Cdr. J. R. Lang. Only about one fifth of the ratings belong to the Commonwealth's Navy, but this ratio will gradually increase as naval airmen are trained in Australia. Many Royal Navy personnel now serving aboard the *Sydney* will, however, remain with the ship for periods of up to two years, a prospect which, in these days of post-war problems and dollar difficulties,

may be regarded as not unpleasing by many of the crew.

As previously noted, Australia's acquisition of the *Sydney* puts on a firm footing the establishment of Naval Aviation in the Commonwealth, and further consolidation is evinced by the beginning of a programme to train 4,300 Australians in the necessary trades. A Naval Air Station was opened at Nowra in August, and another base is planned at Schofield. Commodore E. W. Anstice is Fourth Naval (Air) Member of the Australian Naval Board, and is in charge of the Air Arm.

Possibility of future Australian manufacture of equipment for the new Service was strongly suggested by the foundation, early in 1948, of the Fairey-Clyde Aviation Pty., Ltd., which took over the plant and personnel of the Clyde Company's Aircraft Division, having available at the same time the past and present background of Fairey's extensive experience with Naval aircraft.

The two types of piston-engined aircraft chosen to equip the squadrons for the *Sydney* have been well proved by exemplary service at sea with the Royal Navy. Hawker's Sea Fury F.B.11 has, in addition to high speed, qualities of versatility unsurpassed among to-day's airscrew-driven fighters, and its standard armament of 4 × 20mm cannon is readily supplemented by bombs weighing up to 2,000 lb, rocket projectiles, depth charges or photoflash bombs. The Sea Fury's long range was convincingly demonstrated by a non-stop flight from Manston to Malta earlier this year. No less remarkable for variety of "strike" equipment and adaptability are the Fairey Firefly 5s which equip No. 816 Squadron.

It is a fitting occasion to extend good wishes to the British and Australian crews now taking over a new ship at the opening of this new year.

Cafeteria service is one of the ship's modern features.

A Firefly prepares to touch down at Eglington.

A Sea Fury's Centaurus is revealed during inspection.

Fireflies of 816 Squadron—a study which allows direct contrast with their single-seat companions.

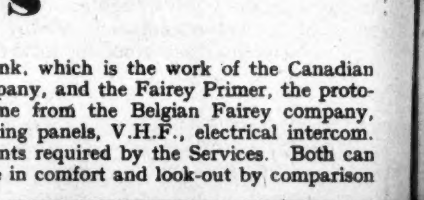
One of the most popular and handsome aircraft introduced since the war, the Canadian de Havilland Chipmunk has delightful aerobatic qualities.

Tandem Trainers

FROM the earliest days of flying instruction, this country has had at least one noted elementary trainer with tandem layout in service at any given time for instruction of R.A.F. and private pilots. It is quite a long time since the last rugged, patient, old Avro 504 retired after a long and creditable career, but its period of operation overlapped with the Tutor and also with the familiar Tiger Moth biplane which is still serving faithfully in all parts of the world. It seems right, therefore, that two more tandem trainers of modern conception should now be available to take over from the Tiger Moth and carry on the strain. Although neither the Chipmunk nor Primer was originally conceived in this island, both have been adopted, and approved wholeheartedly by those here who have flown them.

These two aircraft have been undergoing intensive trials "side-by-side" at Boscombe Down, and upon the results not only from the performance point of view but from those of initial costs, maintenance and serviceability will depend, it is understood, an order, long overdue in the opinion of most pilots, for a Tiger Moth replacement for the R.A.F.V.R. It seems that the announcement in the House last April that Chipmunks had been ordered for the V.R. was inaccurate. There is no indication, incidentally, that examples of the three-seater Prentice basic trainer as used in the R.A.F. schools will be supplied to R.A.F.V.R. units.

Since the war the requirements of an elementary Service trainer have multiplied, particularly in regard to equipment, and there was a risk that in meeting the new specification which, correctly speaking, is for a basic trainer, much of the simplicity, and therefore economy, and possibly the lively performance, would be lost. Both the de Havilland Chipmunk, which is the work of the Canadian branch of the company, and the Fairey Primer, the prototype of which came from the Belgian Fairey company, carry full blind-flying panels, V.H.F., electrical intercom. and other refinements required by the Services. Both can offer a big advance in comfort and look-out by comparison with the earlier open trainers. Nevertheless, both are very manœuvrable and light to handle.

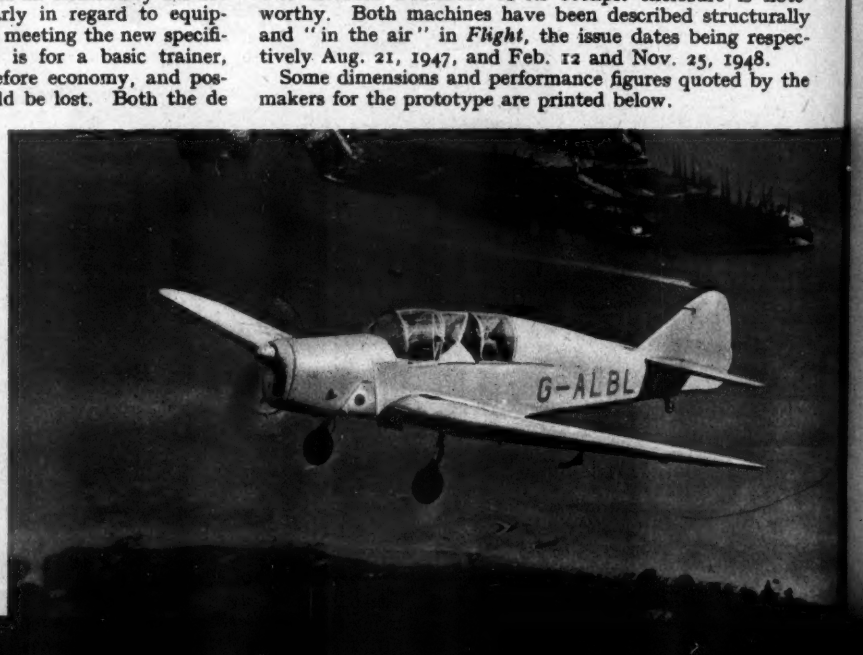


Another Canadian-built Chipmunk not so far seen in this country is the ski-equipped version.

Landing wheels are fixed in both cases but flaps are fitted, and the Gipsy Major X type power unit with which each is powered may carry a manual v.p. airscrew.

The Chipmunk is of particularly clean, all-metal, semi-monocoque construction, and it is metal covered except for the wings aft of the spar. The Primer is designed with extreme structural simplicity and economy in mind, and comprises a welded tubular frame with fabric covering. The unusual treatment of its cockpit enclosure is noteworthy. Both machines have been described structurally and "in the air" in *Flight*, the issue dates being respectively Aug. 21, 1947, and Feb. 12 and Nov. 25, 1948.

Some dimensions and performance figures quoted by the makers for the prototype are printed below.



A comparative newcomer as yet seen by few people, the Fairey Primer combines some unique structural features with commendable trainer characteristics.

COMPARATIVE DATA

	Chipmunk	Primer
Span ...	34ft 4in	32ft 10in
Length ...	25ft 5in	27ft 7in
Max. speed ...	140 m.p.h.	136 m.p.h.
Landing speed	43 m.p.h.	46 m.p.h.
Initial climb ...	900 ft/min	1,020 ft/min
Weight empty	1,158 lb	1,225 lb
,, loaded	1,900 lb	1,815 lb
Cruising range	485 miles	393 miles

Casual Commentary

The Closed Shop in the Helicopter World : Witchdoctor Tactics Amongst the Experts : Designing for a Purpose : Impressions of an Outsider

By ROBERT CARLING

ONCE upon a time—almost, perhaps, until the last war showed that clerks, cornchandlers and even cretins could learn to handle aircraft with fair competency—there was a tendency for the experts to pretend, or even actually to believe, that some very special and supernatural qualities were needed for the proper and safe conduction of any form of flying contraption. There were so relatively few experts that the fiction could be maintained without much difficulty and the peccadilloes of the masters were viewed by the general public with tolerance and even with pleasure.

Nowadays, apart from the few haloes still sitting gently on the heads of the supersonic test pilots or the million-mile airline captains and of the more accomplished instrument-approach kings, the divine rights no longer remain with air pilots of the conventional kind. But I am beginning to wonder if the spare haloes have not floated on to the heads of, and are being tightly held by, the helicopter pilots. They are so very intent on telling all and sundry that nobody else can fly them properly, while assuring the world, nevertheless, that these miracles of out-of-balance engineering are a vitally important means of transport.

Now I know practically nothing about helicopters other than through the scraps of information which can be picked up by the intelligent cross-questioning of the drivers and designers of such things. My own practical experience of rotary-winged devices has been confined to five minutes' dual in a helicopter while moving crabwise at a spanking 45 m.p.h. and to several rather depressing hours spent many years ago in a C.30 Autogiro. During these Autogiro hours I altogether failed to get rid of the landing drift which, though almost imperceptible to the eyes of the pilot of ordinary aircraft, would, I was assured, do several thousand pounds' worth of damage if allowed to continue until touchdown. The relatively recent helicopter experience showed me that a great deal of juggling was undoubtedly required to keep the outfit where it should be while hovering and that in the same condition and in at least this particular machine, there wasn't much power or control in reserve. Otherwise, while flapping merrily along in cruising trim (the only period during which I could be said to have been in sole charge) it seemed to behave like any normal flying machine with the tip of a propeller missing and a spongily overbalanced rudder. In spite of the runway-traction-engine noise I was really quite happy until my very temporary instructor shouted some remark about the unimportance of human life, and the natural unreliability of all engines. We were, it seems, flying along in the danger height-zone, between 30 and 300 feet and engine failure would have left us with no adequate means of immediate support.

Goading the Enthusiast

All of which, to the person suffering even mildly from helicopteritis, will appear to be a gross and unfair libel. I deny that it is libellous, but admit that I have painted the least attractive picture for the unfair purpose of goading the enthusiasts—who continually say, in effect, that the helicopter is full of incurable faults yet is the short-range transport of the future, and is most tricky to fly yet not really so difficult after all. In fact, even in its present form, it has most valuable special uses, but will need considerable development before it can be flown on day and night all-weather services; and it can, with practice, be handled competently by anyone who has sufficiently good reflexes to deal with a complicated mechanical device, but is certainly no toy for the casual beginner.

But when several of one's normally constituted friends have succeeded in mastering the technique after relatively few hours of instruction, it is irritating to be told that the job is one only for the super-specialist—and still more irritating to hear the suggestion put forward, in all seriousness, that fixed-wing experience is a disadvantage rather than otherwise. Such ideas are bad for the future of the helicopter, and give quite as false an impression as the back-garden-transport-for-the-million articles which once tended to appear in the lay press.

Advantages of Air Sense

Any ex-fixed-wing helicopter pilots will agree that it is an exaggeration to say that normal flying experience has no value for the helicopter trainee and palpable nonsense to say that it is actually a disadvantage. So long as a conventional system of control is used, even the plain hand-foot reflexes, built in over so many normal flying years, are worth tens of hours of instruction, and the judgment of distance, height, rate of descent and wind direction is something which only long experience in aircraft can give. As for the suggestion that the fixed-wing pilot's passion for maintenance of flying speed can only be overruled with difficulty—it is as sensible as saying that the person accustomed to flying aircraft with approach speeds of the hundred-odd order will be psychologically unable to bring in an ultra-light at any lower speed. One automatically and immediately accustoms oneself to new conditions and requirements, and feels no surprise at the sensation of relative stationariness. In fact, the value of general flying experience is fully admitted in the American licence requirements which, I believe, demand 100 hours from the scratch beginner and only 25 hours from the already qualified ordinary pilot.

The real difficulties and dangers of vertical or hovering flight seem to me to lie in the facts that control is generally weak and the power-reserve limited, so that every variation in conditions must be anticipated. The very circumstances in which the helicopter has the advantage of the most heavily flapped and slotted aircraft are just those in which the helicopter pilot finds that he has very little to play with. Obviously we want a much greater power reserve for a more rapid rate of ascent, better and less sensitive controls, quicker transition from cruising to autorotation pitch, and a slower rate of autorotating descent. But all these cost the earth in payload, and payload is the one thing which the helicopter lacks—possibly on fundamental aerodynamic and mechanical grounds.

One of the most sensible things said during the recent R.Ae.S. discussion was to the effect that the helicopter is still very much an ordinary aircraft with rotors instead of wings. Perhaps the time has come now, having settled on some particular lift and control configuration, to design a helicopter *as* a helicopter, forgetting all our preconceived notions of fuselage shape and undercarriage arrangement. To design it, too, for a special and not too extravagant series of definite, productive duties.

Nobody really wants just a helicopter. We already know it will go up and down, backwards, sideways and forwards—if we are ready to pay for the pleasure of being thus moved erratically about the local sky. Somebody must now say what useful work he wants it to do and how much he is prepared to pay to have this work done. Then the experts can get down to the business of designing an aircraft for this purpose and this purpose only. The market, in fact and if any, must state its demands.

CIVIL AVIATION NEWS

"Flight" photograph.

FIRST ARRIVAL: B.O.A.C. Constellation, "Balmoral" at Filton, Bristol, the first aircraft for servicing at the Corporation's new North Atlantic base. "Balmoral" was on course only 21 minutes from London Airport and normal chock to chock re-distribution flights are expected to take about 30 minutes.

New Zealand Airlines' Profitable Year : Corporation's Figures for Half Year : Possible Third Airport for New York

HAMBURG'S NEW RUNWAY

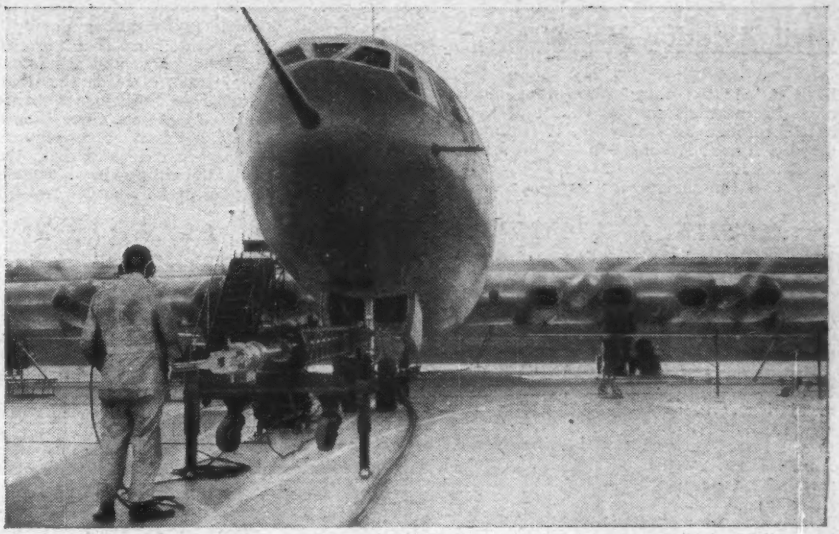
FREEDOM from hills and natural obstacles for miles around makes Fuhlsbuttel airport, Hamburg, ideal for operations in all weather. In 1939 the airport was one of the busiest in Germany and at the outbreak of war it was requisitioned by the Luftwaffe. In 1945 the R.A.F. took over Fuhlsbuttel airfield and it became No. 104 Staging Post, Transport Command, and it continued to be used mainly as a transport and communications base and R.A.F. master diversion airfield. On October 15th, 1947, the Civil Aviation Branch of the Control Commission Government (British Element) took over the airfield and its military status became that of a R.A.F. reserve airfield. During the past year many improvements have been introduced and in August this year 4,234 passengers and 152 tons of freight and mail were handled. With this increase in traffic it became clear that the pierced steel planking runway laid down three years earlier was inadequate for the task, and on April 6th this year construction of a new 2,000-yd. concrete runway was started by No. 5352 (Airfield Construction) Wing of the R.A.F. On December 15th the new runway was opened in the presence of the Deputy Regional Commissioner and the Oberburgermeister of Hamburg, by G/C. C. E. Loveridge, Deputy Director of Works Service. The new runway was then formally "handed over" to Mr. Maurice Banks, Director of Civil Aviation in the British Zone of Germany. It is the first civil concrete runway built in Germany since the cessation of hostilities and the approach lighting is of the Calvert type, similar to the installation at London Airport. Another innovation is a centre line of green lights down the entire length of the runway in addition to contact lights at either side. This has been done to assist take-off in bad visibility. Construction of the runway and equipment for the airfield, especially the approach lighting, was on a high priority owing to the importance of Fuhlsbuttel to the Berlin air lift.

ALTIMETER SETTINGS

SUBSEQUENT to references in the article published in *Flight*, December 16th, on the introduction of a standard setting for altimeters in the R.A.F., further decisions on policy have been made known. The use of QFE, the prevailing station pressure in millibars has been dispensed with for all flying by the R.A.F., and the policy now is that for take-off and landing and for flights in Flight Information Regions below 3,000 feet above sea level and flights in the Control Zones below 1,500 feet, altimeters should be set to QNH. This is the standard setting and is the prevailing station pressure reduced to mean sea level by the ICAN formula. The altimeter will thus read the height of the airfield on landing. Regional QFE, which is the lowest pressure forecast for the whole of the Flight Information Region for the ensuing hour, is used for flights above 3,000 feet in Flight Information Regions and above 1,500 feet in Control Zones. It will therefore be seen from these statements of Air Ministry policy that the R.A.F. does not use the standard setting for all flying, and that the Regional QFF is used for traffic separation purposes in Flight Information Regions. A recent Notice to Airmen states that each Air Traffic Control centre will broadcast the value of the current Regional QFF for its Flight Information Region on all air-ground W/T channels twice hourly, on the hour, and at 30 minutes past the hour. In Meteorological Sub-Area broadcasts QNH will be the only altimeter setting appended to the Station's reports. That in no way affects the availability of QFF or QNH for landing settings however, either of which may be obtained upon request from Air Traffic Control.

NEW ZEALAND BALANCE SHEET

A REPORT of the New Zealand National Airways Corporation for the year ended March 31st, 1948, shows a surplus over operating expenses of £17,757 and a net surplus of £3,426 after deducting interest on capital advanced from the Government. The year represented a transitional period maintained partly by Union Airways of New Zealand, Ltd., and partly by the Corporation. During the year, Regional (South-West Pacific) services were taken over from the Royal New Zealand Air Force and new routes were opened through Auckland, Norfolk Island, Fiji, Tonga, Samoa and Cook Islands and also through Auckland through Suva to Labasa. Internal route mileage was 2,201 and in the Pacific region 5,573 miles. There



ENGINE TESTING: *All eight engines on the Brabazon I have been under test during the past few weeks. Those on the starboard side have been run to full take-off power and those on the port up to 2,100 h.p. It is understood that the Bristol engineers are very satisfied with the tests, particularly with the oil cooling.*
"Flight" photograph.

were 150,040 passengers carried on internal routes and 1,831 in the Pacific region, on which the average passenger journey is 225 miles and 819 miles respectively. The accounts showed operating expenses of £664,918 and passenger revenue of £581,387. The Minister in charge of the Air Department, New Zealand, explained that notwithstanding the substantial increase of passenger capacity provided over the period under review the public demand for air travel continued to tax the resources of the Corporation, and the Board felt that night flying and Sunday services should be introduced as soon as circumstances and facilities would permit, to provide a utility which was freely available in other countries.

THE "AIR PILOT" AGAIN

THE Ministry of Civil Aviation is to re-issue "The Air Pilot" in January, 1949, in the form of a loose leaf book which will be kept up to date by an amendment service, and by monthly supplements. The complete "Air Pilot" in four parts containing general information and sections for meteorology, telecommunications and aerodromes, will cost £1 10s, and the subscription for 1949 for the amendment service is £2 10s. Each part can be obtained separately. The existing series of Notices to Airmen will cease shortly after the issue of this publication. It is yet another financial burden for the private and club flier to bear.

U.S. EXCHANGE NOT NEEDED

ACCORDING to the New York Journal of Commerce, there is at present no immediate need for an air charter Exchange in the United States. This is due to the fact that freight carrying to destinations outside the U.S. is mainly confined to four-engined aircraft over long distances, and the operators have sufficient business to operate according to published tariffs. There are only a few operators of four-engined aircraft and all are well known; moreover, there is little demand for the chartering of complete aircraft, and such business can be easily handled through brokers. It is understood that some American operators have used the European market occasionally when a return cargo was not otherwise available. Since the main interest is speed, the majority of irregular air carriers consider that negotiating through an exchange would waste time. Although many of the U.S. air-

Operating Results for the Three British Airways Corporations

ALTHOUGH the accounts for the full financial year which ended last March have only recently been published, the three British Airways Corporations' provisional operating results for the period April to September, 1948, have now been made available. In 1947, from April to September, the total deficit was £4,690,000 exclusive of the provision for losses of B.E.A.'s subsidiary and associate companies. This was increased by the end of the year to £10,820,000, nearly two and a half times the figure for the first half-year. The greater loss is explained, by the Ministry, by the less favourable results in the winter season and it must therefore be expected that the deficit of £3,990,000 for this first half-year will be more than doubled by the end of the year, and is consequently expected to exceed the £8,000,000 to which the available subsidy limit drops this year from £10,000,000. It is said that the measures of reorganization and economy have not yet had time to influence the financial results, and some relief in expenditure may be expected from the delivery of new aircraft, particularly with regard to B.O.A.C. It is interesting that the operating expenditure and revenue on B.E.A. internal services has increased and the load factor has decreased very slightly. This is due to the employment of Dakotas on all internal services with the exception only of the Scilly Isles ferry and the Inter-Channel Islands routes which are flown with Rapides. The average over-all load factor throughout the Corporations is low and has fallen off considerably since last year, particularly is this noticeable in B.O.A.C. An increase in expenditure in B.S.A.A. is explained by the acquisition of Tudor aircraft and the consequent training and conversion which was necessary. Increased passenger revenue through the operation of these larger aircraft was not fulfilled, it is said, on account of delays in deliveries, and the temporary grounding of the aircraft following the disappearance of *Star Tiger*. Tudor IVs are now back in service.

THE SIX MONTHS APRIL-SEPTEMBER 1948 COMPARED WITH THE SAME PERIOD 1947. FINANCES ARE STATED IN THOUSANDS OF POUNDS.

	B.O.A.C.		B.E.A.				B.S.A.A.		TOTAL	
			1948		1947					
	1948	1947	Continental	Internal	Continental	Internal	1948	1947	1948	1947
Operating Revenue	7,544	6,037	2,181	979	1,570	733	1,118	1,043	11,822	9,383
Operating Expenditure	9,898	8,827	2,324	1,707	2,011	1 579	1,513	1,239	15.442	13,656
Operating Deficit	2,354	2,790	143	720	441	846	395	196	3,620	4,273
Non-operating Expenditure (net)	330	374	26		28		15	15	371	417
Total Deficit...	2,684	3,164	897		1,315		410	211	3,991	4,690
Operating expenditure per capacity ton-mile	53.25d.	70.34d.	57.41d.	69.33d.	75.12d.	80.53d.	44.77d	44.07d.	54.22d.	68.28d.
Capacity ton-miles flown (millions)	44.6	30.1	9.7	5.9	6.4	4.7	8.1	6.7	68.3	48.0
Revenue load ton-miles flown (millions)	28.1	21.4	6.5	3.3	4.3	2.7	4.5	4.1	42.4	32.5
Overall load factor (%)	63.0	71.2	66.6	56.1	66.2	56.6	55.9	61.2	62.1	67.7
Number of employees (average for period)	20,869	23,088	7,385		7,315		1,695	1,150	29,949	31,553

B.E.A. figures are exclusive of provision for losses of subsidiary and associated companies.
B.S.A.A. expenditure and revenue figures for April-September 1947 are 50 per cent of full year's figures : operating statistics are for the actual 6-month period.

Civil Aviation News . . . . .

lines stated that they obtained as much cargo from their own organizations in the U.S. and abroad as they would obtain through an Exchange, it is thought that the setting up of a formal Exchange might be useful in the more competitive Caribbean area, which is operated by small aircraft and where the demand for cargo is more irregular.

SCOTTISH SERVICES INADEQUATE

IT is understood that the Campbeltown Town Council are to make recommendations to the Scottish Advisory Council on Civil Aviation in connection with existing air services operated by B.E.A. The reduction of fares between Glasgow and Campbeltown to bring them into line with reduced fares on the London to Glasgow and Glasgow to Belfast routes is suggested, a daily service starting from Campbeltown instead of Renfrew and a direct air link with Islay are two other recommendations. At present passengers from Campbeltown to Islay have to change at Renfrew. The Council also wish one aircraft to be based at Campbeltown which might be used for the ambulance service. Orkney hospitals are at present applying for permission to resume the inter-island and air ambulance service. In an application to the department of Health it was suggested that the ambulance aircraft should be available to the hospitals at all times or that the service might be combined with the inter-island daily service as before the war.

CONNECTICUT AIRPORT PLANS

FACILITIES at Bradley Field, Connecticut, are being considered by the Connecticut Aeronautics Commission as a possible alternative to the New York airports La Guardia and Idlewild. It is understood that representatives of the trans-Atlantic airlines have been invited to inspect the airfield, and plans for its development as an Atlantic air terminal will be discussed shortly. A terminal building, estimated to cost about £250,000, has already been designed. The Commission has pointed out that the airfield is on the main railway line to New York, and if customs and immigration examination could take place on the train, passengers from Europe would reach New York sooner than those travelling from Idlewild by bus. At present three U.S. domestic airlines use the Bradley Field, a fourth will move in soon, and Transocean Airlines have a large maintenance base there. Both domestic and trans-Atlantic airlines have expressed dissatisfaction with the conditions at La Guardia and Idlewild.

"*Flight*" photograph.

***ANTI FLUTTER**: Temporary mass balances have been attached to the control surfaces of the Brabazon I for the initial flights as a safeguard against flutter which could occur if air were to enter the hydraulically operated system. The hooded mass balances can be easily distinguished in this photograph.*

I.A.T.A. CLEARING HOUSE FIGURES

DURING October the international air traffic transactions put through the I.A.T.A. Clearing House in London totalled £3,668,000 compared with the seasonal peak figure for September of £3,890,000. During the month 29 member airlines were able to settle their October transactions by exchange payments of only £514,000, transfer charges, exchange premiums and interest on 70 per cent of the total being saved by the offset of credit and debit balances. The total transactions of the I.A.T.A. Clearing House for the ten months, January to October this year, now total over £24,000,000 of which 77 per cent has been settled by offset. For the same period of 1947 transactions totalled £10,000,000 with a 61 per cent saving.

INDIAN AIRFIELD PROGRAMME

TO meet the demands of international and internal air traffic the Indian Government has approved a development programme for 21 new airfields estimated to cost 540 million rupees. Santa Cruz Airport, Bombay, and Palam Airport, Delhi, are to be developed as first-class international airports and extensive preparations are already under way. Hangar accommodation is to be increased and runways will be strengthened to take aircraft with an all-up weight up to 200,000 lb. Similar work is in hand at Dum Dum Airport, Calcutta, which will be able to handle aircraft up to 135,000 lb. In addition, major airfields are to be constructed at Allahabad, Madras, Ahmedabad, Lucknow, Nagpur, Vizagapatam and Patna, and 14 intermediate airfields are planned at other places. During the past year 14 airfields have been equipped for regular air services. The first air service linking India and Assam commenced on December 14th, carrying mails and passengers

BREVITIES

DURING the past month Scottish Airlines, Ltd., a subsidiary of Scottish Aviation, Ltd., Prestwick, has made a number of dismissals, including twenty pilots, radio officers, engineers and navigators. The reason is said to be the seasonal decline in the charter traffic.

* * *

According to the Australian Minister for Air, Mr. A. Drakeford, Qantas Empire Airways will make a profit of £50,000 to £100,000 for the period since the airline became wholly owned by the Government. He expected to publish the final figures and declare a dividend shortly.

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Aircraft on the Pan American Airways' route between New York and Buenos Aires will be equipped with "sleeperettes" from January 1st. Passenger capacity will be reduced from 52 to 30 for the 42-hour flight over 6,313 miles.

* * *

The Lord Provost of Edinburgh has written to Lord Pakenham asking him either to visit Edinburgh on January 4th or to receive three members of the Council in London on January 7th to discuss the future of Turnhouse airport. Members of the Scottish Advisory Council are disturbed at the frequent changes in policy for extensions to the runways at Turnhouse and an early decision is being sought.

* * *

Applications for membership of the International Union of Official Tourist Organizations have been received from the United States, Israel and Australia, to take effect from January 1st, 1948. This will bring the membership of the International Union, which now has its headquarters in London, to thirty-two full members and three associate member countries. The next International Conference of the Union will be held in September, 1949, in Luxembourg.

* * *

The Canadian Pacific Airlines services with Canadair Fours to Australia are expected to start next July. Facilities *en route* will be shared with British Commonwealth Pacific Airlines. The existing schedules flown by B.C.P.A. and Pan American Airways do not serve fully the interests of either

Civil Aviation News .....

North America or Australia since both companies arrive in Australia on Saturdays and leave on Sundays, leaving a gap of a week before replies can be sent to air mail letters. Once a fortnight B.C.P.A. runs a service on Wednesday and it is hoped that C.P.A. will make efforts to fly mid-week services.

* * *

Lord Pakenham, Minister of Civil Aviation, visited Malta and Rome from December 20th-23rd to gain experience of air travel on the B.E.A. Continental routes. He discussed civil aviation matters with the authorities of both countries.

* * *

Under an agreement with the Ethiopian Government, T.W.A. are to operate a service between Addis Ababa and Djibouti, French Somaliland, Asmara, Khartoum and Cairo, and Asmara to Khartoum. The airline is to be organized and financed by the Ethiopian Government, and the U.S. Civil Aeronautics Board has approved its operation by the U.S. airline.

* * *

As part of the expansion programme for Bombay airport, reported in *Flight*, December 23rd, rebuilding of the three existing runways, and the construction of a five-storey terminal building is to be included to provide accommodation for Customs and health facilities and the airlines using the airport.

* * *

A Canadian associate of the Hunting Aviation Group, Photographic Survey Co. of Toronto, has recently completed an aerial survey for the Imperial Pipeline Co., Ltd., of the proposed location of a new 16in pipe-line to carry crude oil from Nichu, Alberta, to the refinery at Regina. A photo-mosaic comprising 400 vertical air photographs taken at a scale of one mile to the inch, was prepared of a strip of territory 466 miles long by three miles wide.

FOR THE SPANISH MAIN : The captain and crew of the B.S.A.A. Tudor IV B Elizabeth of England *which recently made its maiden flight to Jamaica. The message sent to H.R.H. Princess Elizabeth, and the Royal reply, were published in the preceding issue of* Flight. *Left to right : Capt. Deloford, First officer S. A. D. Langston, Radio officer J. H. Richardson, Second officer D. B. Lydon, Hostess H. de Haggerston, Steward J. Lewis, Flight engineering officer W. J. L. Arthur.*

On December 16th Pan American Airways increased their all-cargo service between New York, London and Brussels. There are now two flights on Wednesdays and Saturdays, operated by Douglas DC-4s, and one service a week continues to Stuttgart, Istanbul and Damascus. After January 12th this flight will be further extended to Basra, Iraq. The flight terminating at Brussels links up with a C-47 carrying cargo and mail to and from Stuttgart, Munich and Prague. While Stuttgart is being used instead of Frankfurt, a road service is provided between Stuttgart and Frankfurt.

FROM THE CLUBS

ON January 8th, 1949, the Cowes Aero Club are holding their annual dance at the Norton Chalet Hotel, Yarmouth, Isle of Wight. Buffet refreshments and the bar will be available for members and guests, and for those who fly to the Island hangarage and transport from airfield to hotel will be arranged by the club; accommodation for those remaining overnight can also be arranged at moderate charges.

* * *

WEATHER proved a serious handicap to flying in Scotland during October and November and alternate fogs and gales cut down flying time to 63 hours and 41 hours respectively at the Strathtay Aero Club operated by Airwork from Perth airfield. Interest has nevertheless remained enthusiastic and ten new members have joined recently; the social activities of the club have been well supported, having included two successful dances, and the Hogmanay dinner-dance promises to be very popular. The annual general meeting of the club was held on October 20th and following this it was announced that Mr. J. Ure Primrose, the Lord Provost of Perth, has been elected president of the club, succeeding the late Major J. R. Couper, D.S.O.

* * *

HELD at the Park Lane Hotel the tenth annual dinner and dance of the Herts and Essex Aero Club on December 15th was an outstanding success and was attended by some 300 members and guests. The chairman of the pilot's committee, Mr. Victor Ercolani, took the chair at the dinner and with Mrs. Ercolani welcomed the members and guests on their arrival. During dinner it was announced that the chairman would be pleased to take wine "with all those Englishmen who have flown faster than the speed of sound—and Mrs. John Derry!"

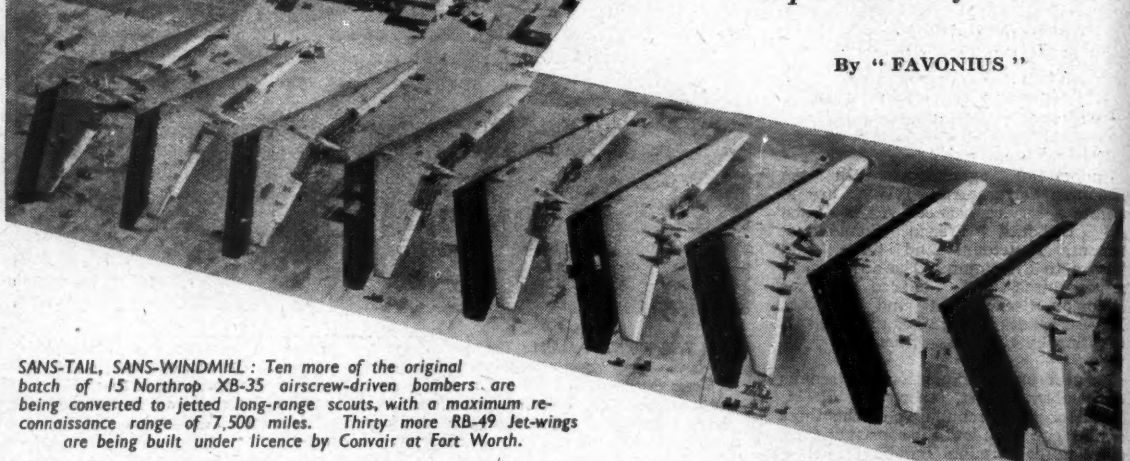
The toast of "The Club" was proposed by Mr. Geoffrey de Freitas, Under Secretary of State for Air, who is a member of the Club, at which he learned to fly, and has logged about 80 hours. Mr. de Freitas said that, as a member of a club, he knew well the high cost of private flying which resulted in it being restricted to men and women in their thirties and forties, and consequently the younger generation were coming to regard flying as something out of the way, whereas it was really the 20th century method of transport. As Under Secretary of State for Air he had the responsibility of seeing that the taxpayers money—£173 millions this year—was used for the air defence of this country. There was more than one school of thought regarding the military advantages of assisting the flying clubs and, he pointed out, a working party was now studying the question of financial assistance for club flying.

Replying to Mr. de Freitas, Mr. Ecolani reviewed the activities of the Herts and Essex club from its foundation in 1930 up to 1939 and gave figures to show that over 25 per cent of the members flew with the R.A.F., Fleet Air Arm and A.T.A. during the war and served with distinction, having gained, besides the 6 D.F.C.s and 17 A.F.C.s referred to by Mr. de Freitas, a Polish V.C., George Medal and an O.B.E.

Entertainment was provided by the well known radio artists Helen Hill, Jon Pertwee and Kenneth Horne, and dancing until the small hours concluded a most enjoyable evening on which the club is to be heartily congratulated.

* * *

FOLLOWING the first official meeting of the Orkney Flying Club reported in *Flight*, December 16th, the names of the officers of the club have now been announced. The chairman is Mr. Marshall, local manager of B.E.A., and the club captain is Mr. Learmouth, of Kirkwall, a former R.A.F. fighter pilot. Other members are Mr. Petrie, who incidentally is already busy on the construction of his own private aircraft, and Mr. Bichan, who has flown with the Edinburgh and also the Loch Leven clubs. The hon. treasurer is Capt. Webster, D.C.M., R.A., who performed liaison duties with R.A.F. Coastal and Fighter Controls as a plotting officer for the Army at Combined H.Q. during D-day operations. A number of members have volunteered to assist in the organization of an A.T.C. unit in Orkney and a Staff Officer from the Scottish Reserve Group, Turnhouse, is expected to visit Kirkwall shortly.



What the Airscrew Designer is Doing to Meet the Competition of the Jet

By "FAVONIUS"

SANS-TAIL, SANS-WINDMILL: Ten more of the original batch of 15 Northrop XB-35 airscrew-driven bombers are being converted to jetted long-range scouts, with a maximum reconnaissance range of 7,500 miles. Thirty more RB-49 Jet-wings are being built under licence by Convair at Fort Worth.

WINDMILLS OR JETS?

WHILE the jet enthusiasts are happily engaged in prophesying the early demise of the airscrew, the industry is emphatically stating that it intends to remain in business. Further, to judge by the promises of the airscrew designer, his section of the industry shows indications of trespassing well into the domain of the jet. In a recent S.A.E. paper discussing the propulsion of future long-range transports, L. H. Enos, of the Curtiss-Wright Propeller Division presents a plausible case not only for the survival of the airscrew, but for its extension as far up the speed scale as 550 m.p.h. Which is about 100 m.p.h. better than the Whittlers are prepared to admit.

Efficiency with Safety

According to its proponents, the industry definitely aims to furnish airscrews that: (1) give the highest possible efficiency in pounds of thrust per shaft h.p. per pound of airscrew weight, and (2) operate safely and without restrictions for long periods of time; in other words, aerodynamic efficiency combined with structural integrity. Efficiencies as high as 85 per cent are claimed for thin-bladed airscrews at cruising speeds around 400 m.p.h., with a loss of only 5 per cent (i.e., 80 per cent efficiency) when operating at a high speed of 550 m.p.h. These efficiencies are based upon full-scale flight tests of single-rotation props using a thrust meter and torque meter. Assuming, however, that some of the coming breed will be turbo-propped transports operating at 30,000-35,000ft, dual-rotation props are almost certainly a necessity in order to hold the blade tip Mach limitation below 0.9. If this is so, the quoted efficiencies probably lean a bit on the optimistic side.

As for the structural side of the partnership, with its bearing on safety, it is freely admitted that vibration problems have become increasingly difficult during recent years, particularly in the case of piston-engined aircraft. The turbo-prop installation, however, uses a very small r.p.m. range and is not subject to the firing torque fluctuations of the piston engine, hence the stress problem so far is easier to handle. To which the jet proponents point out that the combined weight of airscrew and reduction gearing will approach the weight of the engine itself and, moreover, will open up a whole new field of complex problems concerned with gears and control systems. C. L. Johnson, Lockheed's chief research engineer, estimates that existing airscrew problems will be increased three-to five-fold if projected into the realm of new transports with higher speeds, wing loadings and powers.

Braking Drag

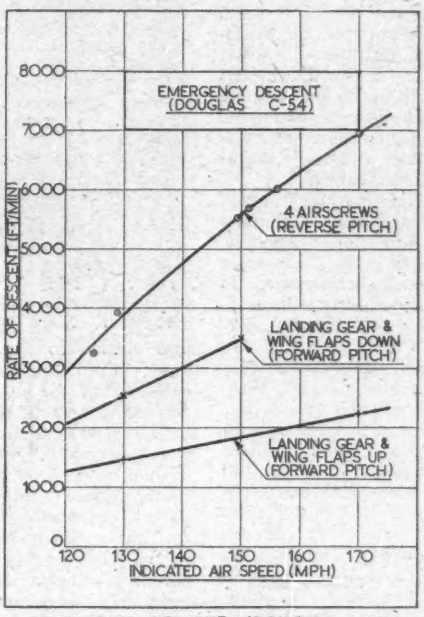
Intensively developed over the past five years or so, the adoption of the reverse-pitch airscrew has added yet one more gadget to the increasing complexity of modern airscrew-driven aircraft, whether piston-engined or turbo-propped. For cutting down the landing run, especially on an iced runway where wheel braking might be treacherous, and for ground manœuvring such as turning and backing up, the reverse-pitch airscrew has become an absolute necessity on large civil airliners and military aircraft. Whether one looks upon this as a token of the march of mechanical progress (from the simple to the sublime, shall we say?) or as an unnecessary evil, depends of course upon one's personal predilection for airscrews or jets during the next decade.

Sidestepping for the moment whether such gadgetry is going to remain long enough on the scene to pay for its expensive birth, board and keep, we agree that the technique of windmill locomotion on the ground when a large multi-engined aircraft is backing up can be quite a diverting spectacle. We recently watched a squad of Boeing B-50s toeing the tarmac by milling back and forth on their throttles, and the sight brought home to us the associated problem of providing adequate rearward view from the cockpit. The B-50, due to its flush nose-type windshielding, calls for a lookout member of the crew stationed aft for signalling purposes—a most intriguing sight which reminded us of a railway brakesman hanging on the back of a shunting loco or wagon during marshalling operations in a freight yard.

Airscrew pitch-reversal on the ground has now been logically extended into the flight regime, the idea being to provide braking drag for increasing the rate of descent at

moderate air speeds. This permits a multi-engined civil or military aircraft to be quickly and safely brought to the ground in the event of emergency at high altitude, while in the case of combat aircraft it also provides a safe and evasive technique for obtaining rapid changes of speed and altitude. Such, at any rate, is the thought of Curtiss-Wright airscrew designers who have been conducting these aerial experiments on a Douglas C-54 transport, and to whom we are indebted for the accompanying data.

This figure clearly shows the air-brake effectiveness of reversing the four airscrews, compared with the more conventional drag methods of landing gear and wing flap extension; moreover, the airscrews are designed to cater for this condition, whereas lowering of the flaps is restricted by specific structural design criteria to moderate speeds only. The high rate of descent of 5,000-7,000ft/min under complete control at relatively low air speeds is a very desirable feature. For example, in the event of failure of the cabin pressurizing system when flying at high altitude, it might make all the difference between survival and disaster, since it is unlikely that oxygen masks could be distributed in time to save all the passengers. (All the same, speaking personally, we dislike the thought of catching up with our stomach while going down the lift at over a mile a minute!)



EMERGENCY DESCENT (DOUGLAS C-54): Rate of Descent vs. Indicated Air Speed.

On recent civil transports where the reverse-pitch control is designed for ground operation only, inadvertent reversal of the propeller in flight is controlled by a microswitch installed in the reversing circuit and actuated by the landing gear torque-scissors. This switch controls a solenoid-operated throttle stop, which prevents airscrew reversal when the aircraft is NOT resting on its landing gear. When the latter is compressed under load, the throttle can be pulled through what is normally the closed position, continued movement increasing the power for reverse thrust. Apparently, for reversal in flight, some form of over-ride device is provided to release the throttle stop, or else the landing gear connection is eliminated altogether. Whatever method is adopted it is more likely that the gadgetry will increase rather than decrease.

Anti-icing

Along the rest of the airframe, the problem of providing adequate anti-icing protection for the airscrew has received a great deal of study by the airscrew manufacturers. The first generally used method of de-icing consisted of slinger rings at the hub, feeding alcohol directly on to the blades. This scheme had severe limitations and was followed by the development of grooved rubber shoes along the leading edge of the blade, which resulted in some improvement, but was still not entirely adequate. The type now in common use incorporates an electrically heated external shoe, which provides a much improved anti-icing element, in place of the earlier de-icing methods. (The distinction, of course, between anti-icing and de-icing is the difference between prevention and cure.)

Just as thermal anti-icing has superseded the rubber shoe on the wing and tail surfaces, so may the airscrew be expected to parallel them. The use of hot air for furnishing the anti-icing requirements of airscrews has been under test for several years and will go into service test on military aircraft next year. This method leaves the blade surface free of any irregularities and is a further improvement over the present external rubber shoe, although the latter has only a very small effect on the efficiency at cruising speeds, so small indeed as to be practically negligible.

The other approach to the problem is to use an electrically heated internal shoe, which also improves the blade surface This scheme is employed on the Curtiss electric four-bladed airscrews of the Boeing Stratocruiser. It consists of electric resistance heating elements connected in series and running lengthwise down the blade, each opposite pair of blades being heated in unison. Airscrew heating is conducted through a rotary timer with eight fixed contacts and a wiping contact, which channels an 8-volt D.C. flow into each pair of blades in turn. Both the hot air and the electric resistance methods should decrease the repair and overhaul work now required on the external shoe type.

Seeing is Believing!

So much, then, for the efforts of the airscrew designer to keep in step with airframe development. Within its appropriate sphere the modern airscrew is a highly efficient thrust mechanism and it is hardly likely to go out of fashion altogether. Oddly enough, even Jack Northrop has recently gone on record in favour of the turbo-prop engine for a long-range transport cruising at 500 m.p.h.—on the score of fuel economy, of course. In one sense, perhaps, this design philosophy is not so odd when viewed in relation to the big Northrop 10,000 h.p. Turbodyne engine now under active development. Nonethless, the case history of the XB-35 all-wing bomber, which has been plagued with an unending series of airscrew troubles ever since it first flew in June, 1946, is not a very healthy record in favour of the modern high-powered airscrew. (Incidentally, one suspects that the asymmetric wing flow into the pusher prop does not lessen the vibration headaches of the unfortunate airscrew designer.) It was not, in fact, until two of the original order for 15 were converted into YB-49 jets that this unique aircraft began to show its real capabilities.

A certain touch of irony has been injected into this particular case history by the announcement that the U.S.A.F. has now ordered the conversion of the remaining piston-engined XB-35s into jets. All, that is, with the exception of three guinea-pigs which, apparently, will continue the difficult struggle to evolve a satisfactory dual-rotation pusher prop installation—possibly in combination with a piston-turbo compound or a turbo-prop engine. By the time this has been successfully accomplished, the production Jet-Wing—whether RB-49 long-range scout or B-49 long-range bomber—should be mounting more powerful turbo-jets and climbing farther up the speed and range ladder. Right now, a visitor to Southern California can walk by the Northrop plant and actually see this windmill-jet conversion process taking place *al fresco* in the sun—for all the world, as well as the engineer, to see. And seeing is the most convincing form of believing.

PLASTIC PROTECTION

A NEW raw material for protecting metallic articles and components against damage and corrosion has been produced by Clear Glass Products, Ltd., of Southampton, known as "Avigel" plastic peel, this substance is easy to apply and remove and affords protection for any metal against oxidation, acids or chemical attack, or sea water. The substance can be melted in a suitable container at about 150 deg C., and parts to be protected are dipped in the fluid at about 170 deg C. A slit enables the coating to be peeled off and, in the interests of economy, returned to the melting pot.

TURBINE TRAVEL

Airborne in the Vickers Viscount

ON their third attempt, Vickers-Armstrongs managed, at Blackbushe last Tuesday week, to acquaint air correspondents with the delights of travel in a thoroughly modern transport aircraft powered by turbo-props. Through no fault of the Viscount—for that beauteous medium liner was, indeed, the chosen instrument of indoctrination—two previous excursions to the maker's airfield at Wisley had proved disappointing. Grounded in company with Mr. George Edwards, however, one was able on those occasions to assimilate a great deal of information, the gist of which appears hereafter.

The Viscount, now wearing Service markings, stood ready and waiting on the wet tarmac at Blackbushe under lowering cloud, in which icing was foretold at 2,000 ft. Through the oval-shaped rear door one entered the main cabin (adequately, though not sumptuously furnished, in conformity with B.E.A. standards) and, passing the mid-ship pantry, seated onself by the face of the main spar. This position was judged to be the most revealing for assessment of vibration, and, moreover, allowed a battery of flight-test instruments to be conveniently scanned. With some twelve passengers, the Viscount weighed 37,700 lb—more than 7,000 lb less than the gross weight possible with the new 1,400 h.p. Rolls-Royce Darts, later to be installed.

With a whir and a whistle the Darts came to life, and as Captain "Mutt" Summers advanced the throttles the whistle gave way to a very noticeable, though far from unpleasant, roar. The six-wheel "tricycle" afforded smooth taxying to the head of the runway, and one was immediately impressed by the breadth and depth of vision allowed by the deep oval windows and slender nacelles.

The r.p.m. needles having scurried round the dials to 14,500 r.p.m., the Viscount covered what Capt. Summers later estimated as 600 yards of the wet runway, unstuck smartly, and apparently had to be restrained from nosing straightway into the murk above. A ground observer clocked the take-off run at 19 seconds. On the level, at 500-800 ft, 11,500 r.p.m. and 225 m.p.h. indicated, one recorded such impressions of noise level and vibration as could be formed. It is important to appreciate that flying conditions were decidedly rough and that to cruise one of the world's fastest airliners at a few hundred feet was (as F/L. G. R. Bryce, the co-pilot, expressed it) "like riding a racehorse on a sandy beach." There was the difficulty, moreover, of deciding to what extent the very slight vibration experienced was induced by bumps, but one could readily believe Mr. Edwards' account of how, in cruising flight at height, under smooth conditions, his propelling pencil set on end (*not*, admittedly the pointed one) remained so for 20 minutes.

Noise Level

Concerning noise, one had no doubt that the Viscount was the quietest aircraft in which one had flown. Nevertheless, having previously learned that, compared with the Viking, the noise level has been reduced by 20 decibels in the low-frequency, and by 10 in the high-frequency, range (equivalent to eliminating 99 per cent of all external noise energy) one had to confess some slight disappointment. Though no sepulchral silence was expected, the subdued roar of the turbines close alongside was not quite so subdued as had been hoped. This impression, be it remembered, was formed when seated well forward, in the region of the power units; in the main cabin, normal conversation is possible at a distance of several feet.

One was left with no doubt that this single quality of quietness (and virtues abound in the Viscount) will immediately "sell" any passenger fortunate enough to travel in the machine. The lessening of fatigue it conduces is no less a boon to the crew, and the gratification of wireless operator W. H. Fell could readily be shared.

From Andover, the Viscount flew back to Blackbushe, and thence to Basingstoke. Having selected "wheels down" Capt. Summers now received visual and aural indications that the port main assembly remained up. Some conferring and tinkering followed and the Viscount was brought low over Blackbushe Control, the inmates of which were requested by R/T to confirm that all wheels were in landing position. This they obliged by doing, and with the remarkably effective double-slotted flaps extended, Capt. Summers started the approach. The dull roar of the Darts died away, giving place to a whistle, and the r.p.m. hands scampered back to the low thousands. The wheels touched at 100 m.p.h. indicated, and after rolling for a very few seconds the Viscount was taxying in.

One disembarked fully convinced that the Viscount has given this country a technical lead, in the medium air liner category, of 2-3 years. It is exceptionally quiet and vibration free; it lands slowly; has crash-proof tanks and double wheels; burns fuel with a high flash point and low rate of flame growth; it will cruise at 350 m.p.h. and the passengers see more of the ground than from more conventional low-wing transports. Having done an "exercise" in which the characteristics of the Viscount with four Dart turboprops, two turbojets of the Nene class, and two Centaurus piston engines were investigated, Mr. Edwards is confident that with the 1,400 h.p. Darts it will prove *at least as good* on a pence-per-ton-mile basis as would the piston-engined version. Power plant and airframe maintenance periods promise exceptionally well.

The future of the Viscount is so obviously interlinked with that of the Dart (although no decision has yet been taken as to the power units for the second prototype) that the intensive service-testing of that excellent little turboprop has become a vital requirement. Figures which follow are testimony to the efficiency of the new 1,400 h.p. Darts in the Viscount: Take-off weight, 45,000 lb; max. wing loading, 50.8 lb/sq ft; cruising speed (68 per cent power) at 30,000 ft, 350 m.p.h.; cruising speed (68 per cent power) at 25,000 ft, 333 m.p.h. H. F. K.

H.V.P. RETIRES

AFTER more than 30 years' continuous combined service with Supermarine and Vickers, Mr. H. Victor Paine is retiring at the end of the year. For most of that time he has been in charge of publicity and advertising, and has thus become a familiar figure to the Press. His duties will be taken over by Mr. H. V. Usill, who is manager of the publicity department at Vickers House.

Victor Paine joined the Supermarine Aviation Works, then owned by his brother, Hubert Scott-Paine, in 1917, and saw the great development of the firm, first under the joint leadership of his brother and Commander James Bird, and, later, under the amalgamation of Supermarine and Vickers, he handled the two sides—Weybridge and Woolston.

We wish Victor Paine happiness and contentment in his retirement. He will be greatly missed.

REVIEW OF 1948 *(Continued from page 774)*

Units. In March the famous No. 84 Group, which played so splendid a part in the Invasion, was disbanded. Simultaneously the wartime system of emergency commissions was discontinued.

Mr. Arthur Henderson, the Secretary of State for Air, made the first mention in September of a new scheme for enlisting all categories of aircrew, under which a greatly increased number of pilots and navigators receive commissions, some permanent and guaranteed on entry; an initial engagement of eight years' regular service being specified in all other cases. For navigators, signallers and engineers, however, commissions can only be obtained in ground trades, on termination of aircrew service. Throughout the year demands were made for increases in the Services' pay rates, and were officially recognized in December, when the latest pay scale was introduced, providing varying increases in airmen's daily rates of pay, dependent upon trade and length of service, and while there was no increase in officers' pay their marriage allowances were increased. Many critics state, however, that actual benefits from the new rates are often small, and that various deductions whittle down the theoretical amount.

Some incentive through opportunity, hitherto denied to R.A.F. conscripts, was a most welcome feature of the November announcement that one in every sixty National Servicemen would receive either a ground branch commission, or training as a pilot. Since insufficient time will be available for training to full "wings" standard, National Service pilots will wear a "modified" badge, which takes the rather uninspired form of the familiar "kitehawk" already displayed upon the shoulders of airmen's tunics.

Aircrew enlistment and pay systems similar in broad outline to those embodied in the R.A.F. were introduced also to Naval Aviation during 1948. Carrier-borne "musts" for the immediate future were shown to be strike aircraft, and jet fighters. Advanced versions of the Wyvern have been mentioned in the former connection, while Navy jets have as yet reached only the trials stage; production model Sea Vampire 20s, the Attacker, and an experimental Meteor have all made extensive deck-landing tests. Meanwhile, piston-engined excellence has been exemplified by squadron-service Sea Furies and Sea Hornets.

Turning to "week-end" air forces, the end of 1948 finds a heavier accent on the importance of the auxiliary bodies. On the first day of the year *Flight* announced the formation of seven new squadrons for the Royal Auxiliary Force Regiment; this initiated a year of expansion and increased activity for all arms of the reserve—the R.Aux.A.F., Royal Observer Corps, R.A.F.V.R., Fighter Control Units and A.T.C. Rearmament of Auxiliary squadrons with jet fighters was forecast for 1948, but progress was not as rapid in this direction as might have been hoped; two squadrons—No. 605 and No. 500—received early mark Meteors and Vampires. All the Auxiliary squadrons attended summer camps, either in this country or at Lübeck.

The ranks of the R.A.F.V.R. were swelled by the recruitment of W.A.A.F./V.R. pilots, ex-Service navigators and signallers, and personnel for ground trades. "Tiger" flying continued at a healthy rate, although many pleas were voiced concerning the need to provide the "V.R." with a more spirited machine. The R.N.V.R.'s four Seafire-equipped squadrons have continued training, and recruiting for spare-time Naval ratings has begun, but no increase in the number of R.N.V.R. squadrons is possible under the present allocation of funds, despite the large number of ex-Naval pilots anxious to serve. The main problem of the authorities during the past year has been the poor response to the recruiting drive for ground branches of the air reserves, an outstanding case in point being that of the raid-reporting Fighter Control Units.

For the R.A.F. and Naval Aviation 1948 was a year of activity, goodwill visits air displays, "open days" and combined exercises all receiving greater prominence than, though not displacing, normal training programmes. There is little doubt that pre-eminent in any future review of this period will be the R.A.F.'s splendid part in the aerial supply of Berlin, with particular tribute to the crews of Transport Command, several of whom were decorated for their work.

A feat of historical importance was the first Atlantic crossing by jet aircraft, credit for which is shared by the Vampire 3s of No. 54 Squadron and the men who flew them, from July 12th to July 14th, across the Atlantic, and during the subsequent tour of America, which was an unqualified success. Also in the United States last summer, to give an equally fine display of flying, were the pilots of 806 Naval Squadron, with two Sea Furies, two Sea Hornets, and a Sea Vampire. The Squadron also demonstrated in Canada. Other notable examples of goodwill flights were 65 Squadron's trip to Norway last May in their newly issued Hornets, the consequent return visit by Mustangs of the Swedish Air Force, and the fly-past by Meteors from Horsham St. Faith at the opening of the British Exhibition at Copenhagen in September.

Exercises and demonstrations were many and varied during the year, and were concluded, strangely enough, by a *Sunrise* which, though darkened by a storm of controversy, focused at least one pale but revealing ray on the weak condition of our bomber force.

Fighter Command's Meteor 4s and Vampire 3s, the Hastings of Transport Command, which went almost direct from factory to air-lift, and the new trainers, basic and advanced, on the point of production, all help to make up part of a reasonably reassuring picture of effective air power. Essential for its completion is the arrival, as soon as possible, of modern bombers and coastal aircraft. Production of these, in particular, and in general, the maintenance of a strong and contented Air Force, might be an admirable air resolution for this New Year.

CHRISTMAS-DAY LANDING

ON the morning of Saturday, December 25th, the 50,000th aircraft landed at the R.A.F. airfield at Gatow, Berlin. Over 700,000 tons of supplies have been flown into the city's airports—Gatow, Tempelhof and Tegel—since the air lift began in June, and in one 24-hour period over Christmas 6,099 tons were transported.

DANISH VISITORS AT GLOSTER

IT was learned over Christmas that a Danish military mission visited the Gloster Aircraft Co. on December 13th and 14th. In command was Capt. Rasmussen of the Royal Danish Navy, who flew not only a standard Meteor 4, but, after briefing by S/L. "Wimpey" Wade, the Hawker P.1040 also. Other members of the mission were given flights in the Meteor 7 trainer.

U.S. SECRETARY OF AIR AT BURTONWOOD

BURTONWOOD, American depot in Lancashire, received two important visitors during Christmas, namely, Mr. Symington, United States Secretary of Air, and Lt.-Gen. J. Cannon, U.S.A.A.F. Commander in Europe. They had travelled from Germany during the holiday after making some other Christmas visits to units there. Mr. Symington said that new aircraft were being bought for the Berlin air lift, but "the type had not been released." Asked if the Air Lift would be increased, he said: "Yes, if we are asked to increase it, but there is no immediate intention of stepping up the tempo. They are doing a fine job over there, and are able to meet all demands made."

Some 3,000 officers and men and a great deal of equipment have now arrived at Burtonwood, which has become the main U.S.A.A.F. equipments and repair base in Europe, and is at present mainly concerned with the Air Lift and with B-29 squadrons stationed in this country.

SWISS VAMPIRE LICENCE?

DE HAVILLAND Vampire fighter-bombers may be built in Switzerland under a licence agreement now being negotiated. Certain components may be supplied from this country. The supply of 100 D.H. Goblin turbojets is also being discussed.

Having accumulated experience with three standard Vampire 1s and a fourth machine of the same mark modified to carry R.P.s and bombs, the Swiss Government has already placed an order for 75 Vampire 6s, which are generally similar to the Mk. 5s on order for the R.A.F.

ROOM WANTED

ARRANGEMENTS for the first flight of the Universal, largest freighter to be designed and constructed in this country, are likely to prove something of a problem. This 95,000 lb aircraft with four Hercules engines and 162ft wing span is now the responsibility of the merged Blackburn General Aircraft company. Although the Universal has been designed to operate with load from comparatively small fields (its wing area is 2916 sq ft and power loading 12.2 lb/h.p.), and is quite capable of taking off from or landing on the 800 or so yards of grass at Hanworth where the prototype is being built, the M.o.S. have decided against this course. It will, therefore, be necessary to dismantle the aircraft and transport the units by road to a suitable airfield. The nearest large runways are only a mile or two away at Heathrow.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

CONVERSION COURSES

A Navigator's Lament

IN your issue of November 18th I was interested to read an article entitled "Gliding and the R.A.F.," by F/L. Neubroch. It mentioned, amongst other things, the advantages or otherwise accruing to a navigator who, before commencing pilot training, had acquired some gliding experience.

Now, I am a navigator, too, and after seven years' experience, both military and civil, and some 1500 hrs, am convinced that: (1) there is no future in it, official statements to the contrary notwithstanding; and (2) I'd far rather drive anyway.

Having joined up as an observer in 1941, because they were full up with pilots, I now find it impossible to obtain a conversion course, although I know there are some now in progress.

I have a few hours' civil pilotage experience, on Tigers and Austers, and an "A" licence, and am convinced I would pass a Service flying course if I could only get on one.

So if F/L. Neubroch could let me know by what "fiddle" his man managed it, I shall be very obliged to him.

F/O., R.A.F.

MANNING THE R.A.F.

Happiest Days in the Finest of Forces

AS an ex-member of the now nominated "experienced ground crews," I read your editorial in *Flight* of December 2nd with, I regret to say, callous amusement. Surely you types know why there is such a shortage of "engine bashers and string and glue merchants," as we used to be called, in the R.A.F. of to-day, even if the Peers do not, as they obviously don't.

Until such time as there is another war, the R.A.F. must compete with civil aviation and similar trades for their engineering personnel, and what man in his right senses is going to give up a civil occupation for one in which he is merely a number and only the last three at that!

If the Air Force of 1948/9 is very different from the wartime and pre-war farce, then I stand to be corrected, but these are the things I objected to most of all during my service: (1) Promotion by length of service and irrespective of merit or proficiency (the pre-war L.A.C.'s or Sgt's. educational exams were childish). (2) After a hard day's work in flights doing a guard duty or sweeping out admin. block or something equally ridiculous. (3) Fatigues—what civil firm would dream of detailing their staff (office or technical) for washing up dishes in their canteen? (4) Never being able to set up a home for a period of more than a year at most, before being sent packing off to the other end of the country, whilst a person who was quite happy at this particular God-forsaken hole you are dumped in is sent to replace you, or you him. (5) Is the modern air force the same as pre-war, when at the squadron dance in the hangar the lowly erk with his wife, fiancee or maybe just a girl friend, drinks beer in a corner of the hangar at a bar over which hangs the disgraceful sign "Airmen and their women." (6) Must an N.C.O. tradesman "carry" a stupid inexperienced person called an Engineer Officer because the latter type happened to go to the right school or worked in a drawing office as a youth—I am referring to the direct entry wartime engineer officer type, of course, one who hardly knew a 2BA nut from a spring washer. (7) Charging madly about the countryside for a week with one's head covered in grass and endeavouring to look like a hedge. Have you ever seen a blue hedge? After all, a soldier is not expected to do a D.I. on an aircraft; but I do agree that an airman must be able to fire a Sten or rifle with reasonable accuracy, but they might just as well go the whole hog and teach our "skilled ground crews" naval gunnery, or N.F.S. fire-fighting; it's that system which induces jack-of-all-trades and master of none. (8) Last but not least, do make your engineer immune to that awful creature called the station warrant officer—he has to be seen and heard to be believed.

And finally, sir, don't forget that the ground crew in peacetime have all the sweat and dirt to contend with and none of the thrills and glamour of flying, so if you want the intelligent keen volunteer, you must offer a job commensurate with the required knowledge and skill, and that is not only pay and bedside lamps; but he does expect an ordinary decent bed on linoleum and not the Himalayan range to sleep on and the desert wastes to put his feet on, and furthermore, why shouldn't he dress decently? Does he have to wear farm labourer's boots? They are bad for aircraft anyway, and an airman's kit is the weirdest collection of motley clothing and strange devices called equipment that one would wish to see.

I can hear the brasshats (I don't kid myself that they're likely to read this even if you publish it) saying that this fellah can't take discipline; but there we are, we used to call it all by a very well-known term, and it rather looks to-day as if there are a lot of other fellahs that can't and don't intend to sample it, so if the R.A.F. want volunteers, it is suggested they try a different system.

For all that, I spent the happiest days of my life with the finest of all Forces and the best of friends, but I prefer it as a memory rather than a reality. B. C. PHILLIPS.

Uruguay, S. America.

The Letter from "Private Flyer" in the issue of December 16th has drawn the following:

Open Letter from De Havilland

THE cry from one of the abandoned falls upon sympathetic ears. Verily the Moths that we gave you were our own pride and joy as they were yours, and sadly do we lament their passing. War is indeed a senseless folly, taking from us our proteins and our pleasures, and bringing in its wake dull fare and discouragement.

The Tiger and the Leopard Moth and the Hornet Moth gave all of us great spirit in our daily tasks. The Moth Minor, with 25 happy miles to the Imperial gallon and a hundred of them in the hour, was cut off in its youth by the foolhardy challenge of a humourless people, malevolently led. Less than six hundred pounds it cost. A coupé top it attained, and doubtless it would have developed in diverse glad ways, as all good offspring do, to bring felicitations to the many, regardless of colour and creed, to the humble executive as to the man of brawn.

When the fury passed there were, alas, no pence for pleasures light. Our beloved clubs sought in vain the smile of the gods of the state. Our country was never more in need of airminded youth, and if there were but the facility to fly at one pound sterling for the hour aloft all anxiety concerning the recruitment of our aerial forces would vanish, as would the necessity for publicity campaigns to draw young men to the ardua that leadeth to the astra.

Never could such as we of Hatfield hope to find an outlet for new Moths abroad without some usage of them in our own land. And indeed the world is distraught with perplexities of more ponderous weight.

Our lighter-hearted cousins in the New World came forth and gave us a Chipmunk, a lovable creature withall and a comely, but he seeks to the left and to the right for a change of heart in the mankind which he longs to serve.

But we who have known lean times before and have prospered out of them will weaken not when all look to us to show the example of industriousness, to point the way of wisdom. By our efforts shall we in due time rise above it all, on wings as light and with gipsies as sweet as ever danced in the sunny skies. HATFIELD, DECEMBER 17th, 1948.

FORTHCOMING EVENTS

Until Jan. 20th.—Royal Geographical Society and Institute of Navigation: Joint exhibition, "Navigation through the Ages." Jan. 10th.—Three films on radio systems. Commentary by R. F. Hansford.

Jan. 3rd.—The Institute of Transport (Metropolitan): "The Effect of Nationalization on Air Transport," J. W. S. Brancker, M.Inst.T.

Jan. 11th.—R.Ae.S. (Belfast): "One Thousand Miles an Hour," Prof. G. T. R. Hill, M.C., M.Sc., M.I.Mech.E., F.R.Ae.S.

Jan. 14th.—The Institute of Transport (Northern): "Commercial Aviation," F. N. Hillier.

Jan. 15th.—British Interplanetary Society: "The Problem of Interplanetary Flight" (Part 2).—"The application of Nuclear Energy," L. R. Shepherd. A summary and Discussion of Parts 1 and 2 will follow.

Jan. 19th.—R.Ae.S. (Brough): Lecturettes by branch members.

Jan. 19th.—Royal United Services Institution: Films, "Operation Crossroads" and "Operation Plainfare," W. Courtenay, M.M.,

Jan. 22nd.—Helicopter Association of Gt. Britain: "Helicopter Operations—Some of the Problems and Prospects," N. E. Rowe, C.B.E., D.I.C., B.Sc.

SERVICE AVIATION

ZERO HOUR AT WYTON: In front of Lincoln D-Dog are foxhounds of the Fitzwilliam Hunt, waiting to move off; a scene at the recent meet on the airfield at the invitation of the Station Commander, G/C. Lang.

R.A.F. Appointments

RESERVE Command appointments recently approved are those of A. Cdre. A. D. Gillmore, C.B.E., who succeeds A. Cdre. B. V. Reynolds, C.B.E., as A.O.C. No. 64 (Northern Reserve) Group, and of A. Cdre. T. N. McEvoy, C.B.E.—A. O. C. No. 61 (Eastern Reserve) Group in succession to A. Cdre. Sir Harry Broadhurst. Both A. Cdres. Reynolds and McEvoy have spent this year at the Imperial Defence College, to which Sir Harry is going for the 1949 course.

The post of A.O.C. R.A.F. Station Manby. and Commandant of the Empire Air Armament School there, has been filled by A. Cdre. J. G. Franks, who has been at the Ministry of Supply as Director of Armament Research and Development (Air) since February, 1945.

W.A.A.F. Appointments

THE following appointments in the Women's Auxiliary Air Force have been announced: G/O. M. H. Barnett to be Deputy Director W.A.A.F.(2) and Wg/O. Lady Seton to be Inspector of the W.A.A.F. with the acting rank of Group Officer. The promotion of Wg/O. J. L. A. Conan Doyle, O.B.E., to Group Officer has also been approved.

Air Safety

TRANSPORT COMMAND'S monthly accident return for last October, lately issued, shows that 2,700,000 passenger miles were flown without an accident involving death or injury. The figure relates to airline scheduled services, special flights, and trooping, by Transport Command, and other Commands of the R.A.F.

Naval Officer Wins E.T.P. Cup

THE McKenna Cup, presented to the student who passes out top of the annual Empire Test Pilots' Course, has been won this year by Lt. (A) J. Elliott, R.N. This is the first occasion on which this award has been won by a Naval officer. The courses are sponsored by the Ministry of Supply, at the Empire Test Pilots' School, Farnborough, lasting 9 months; they are attended by some 30 or more selected candidates from the various Commonwealth Services concerned with aviation. This year, the seventh, there were six Naval candidates. The presentation of the Trophy to Lt. Elliott was made at a dinner reported in *Flight* of December 9th.

Royal Air Force and Naval Aviation News and Announcements

Passing-out Parade for R.A.F. Cadets

THE Deputy Chief of Air Staff, Air Marshal Sir Hugh Walmsley, took the salute when 87 newly commissioned R.A.F. officers paraded at the O.C.T.U. at Spitalgate, near Grantham. Sixty-four of those on parade were National Service men, and 20 ex-airmen aircrew. The Air Marshal presented Swords of Honour to the outstanding officer cadets of two courses—Pilot Officers Gough and Turner—and afterwards addressed the cadets.

Call-up Advice

YOUNG men intending to spend their period of National Service in the R.A.F. are urged to visit the nearest R.A.F. recruiting centre between the dates of registration and medical examination for advice and optional tests.

New R.A.F. Badges

THE two latest R.A.F. station badges to be approved are those for Cranwell and Finningley. An eagle with, in heraldic phraseology, wings expanded and inverted, perched upon a rock, is shown on the Cranwell badge, with the motto "Alitum Altrix" (Nurturer of the winged). The Finningley badge bears "in front of a sprig of oak a rose" with the motto "Usque ad Coelum Fines" (Extending as far as the skies).

Past versus Present

FOLLOWING the successful inaugural match last season, a second Past v. Present Halton R.A.F. Apprentices' Rugby football match will be held on the occasion of the next passing-out parade at Halton on February 16th, 1949. Ex-Halton apprentices who wish to be considered for selection should communicate with F/L. R. G. C. Castell, Air Ministry, Room 644, Alexandra House, Kingsway, W.C.2, giving their number, rank, name, entry, playing experience and position, and station at which serving.

Navy Gas Turbines

NAVAL appointments to the Ministry of Supply have been announced by the Admiralty. Capt. (E) W. K. Weston, O.B.E., R.N., has been appointed for duty with the Chief Naval Representative of the Ministry at the Naval Marine Wing of the National Gas Turbine Establishment, which is to carry out development work on marine gas turbine plants for Naval purposes. He is one of the small group of engineer officers who have passed the Staff Officers' Course at the R.N. College, Greenwich.

Capt. C. W. Byas, R.N., has relieved Capt. H. L. St. J. Fancourt, D.S.O., R.N., as Director of Naval Aircraft Development and Production and Deputy

Service Aviation . . . . .

Chief Naval Representative (Air), Ministry of Supply. He learnt to fly in the second course of the Fleet Air Arm in 1925, and subsequently flew Fleet aircraft in the *Eagle* and *Hermes*; he also was pilot of the Parnell Peto which was the only aircraft ever to be operated from a British submarine. He was promoted Commander after commanding a Fleet fighter squadron in H.M.S. *Hermes* in 1936, and after a staff appointment he was Commander of the cruiser *Dorsetshire* when sunk by Japanese aircraft in the Bay of Bengal. Promoted Captain in 1943, he was Director of Air Organization at the Admiralty and later commanded the escort carriers *Queen* and *Arbiter*.

Show for Schoolboys

BOTH the Navy and the R.A.F. will be exhibiting at the Schoolboys' Own Exhibition, which will be opened at the Royal Horticultural Hall on Saturday, January 1st, at 10.45 a.m., by Admiral of the Fleet Sir James F. Somerville, G.C.B., C.B.E., D.S.O. The naval stand includes a complete engine-room control platform from a destroyer, a fire-control box operating model guns, and models of the carriers H.M.S. *Illustrious* and H.M.S. *Superb*.

A power-operated turret from a Lincoln, mounting two 0.5in Brownings, will be a big attraction at the R.A.F. stand, and a gyro sight will enable the young visitors to train the guns on a selection of models hanging from the roof. A Kirby Cadet glider, as used by the A.T.C., will also be displayed.

Auxiliary Appointment

S/L. J. P. BANTON has been appointed to the command of No. 3512 (County of Devon) Fighter Control Unit, R.Aux.A.F., located at Exeter.

S/L. Banton has been a member of 3512 F.C.U. since last January. He enlisted in the R.A.F. as an airman on New Year's Day, 1941, and was released in August, 1946. During the last twelve months of his service, S/L Banton was engaged on flying control duties at Watchfield and Boscombe Down.

AIR-LIFT MILESTONE: When the 100,000th ton of food to be flown into Berlin during the air-lift arrived at Wunsdorf in the British Zone, G/C. Whitley, Station Commander, and Lt.-Col. Myddelton helped to unload the aircraft. Watching is Berlin's Deputy Lord Mayor, Frau Shroeder, who made presentations to the crew.

R.A.F. Permanent Commissions

GENERAL DUTIES BRANCH.

Squadron Leaders: C. N. Birch, A.F.C., D. D. M. Butcher, O.B.E., E. H. King, K. J. Powell, D.F.C., B. L. Watkin.

Flight Lieutenants: D. B. Ainsworth, R. K. Bailey, A. F. Bell-Williamson, B. Burton, B. W. Clayton, D.S.O., D.F.C., C.G.M., J. E. Close, E. L. Connor, R. U. P. de Burgh, L. Hague, E. S. Hughes, D.F.C., T. H. Hutchinson, P. W. S. James, J. E. Kilduff, N. E. D. Lewis, W. S. McLehose, N. G. S. Marshall, P. D. F. Mitchell, D.F.C., A. F. Osborne, D.F.C., J. N. Quick, W. P. Swaby, M. T. Wainwright, D. G. Walker, R. E. Williams, D.F.C., W. J. Williams, D.F.C., J. W. Wilson, S. B. Winn, D. Wood, R. Woodhouse, J. C. Woods, F. C. D. Wright, D.F.C., D. A. Young.

Flying Officers: D. A. Blair, R. W. Bradley, W. R. Collins, A. Herbert, A. Johnson, I. A. L. O'Dell, J. L. W. Towler, S. Wilkinson, T. R. J. Williamson.

TECHNICAL BRANCH.

Squadron Leader: A. Cross, O.B.E.

Flight Lieutenants: J. A. Blythe, P. D. Cherry, D.F.C., D.F.M., W. N. Cockayne, P. H. Hards, L. H. Henry, G. K. King, C. W. Layton, M.B.E., J. H. Maguire, R. E. G. Piff, F. J. Rimer, J. M. F. Taylor, T. Thomas, H. O. Stephens.

Flying Officer: V. C. Appleton.

SECRETARIAL BRANCH.

Squadron Leaders: A. E. Carpenter, W. E. Chadwick, L. C. J. Smith, C. J. Williams.

Flight Lieutenants: E. Cathcart, A. Coates, T. W. E. Dexter, P. E. Gates, V. I. Jones, F. W. J. Kemp, J. R. Marshall, W. A. Pattison, W. F. Scott, A. L. Sharp L. E. Tomkins, D.F.C., L. T. Walton, D.F.C., C. E. Warn, F. L. Western.

Flying Officers: R. Booth, H. W. Cornish-Underwood, D.F.C., P. D. O. Coryton, K. F. Currey, S. J. Fielding, K. F. Fletcher, E. E. Goldie, S. G. Head, E. C. Henderson, E. E. James, J. F. L. Long, G. M. Wade.

MARINE BRANCH.

Squadron Leader: J. G. E. Horne, O.B.E.

Flight Lieutenants: W. H. Elliott, D. A. Foster, S. Rowland, S. J. Snowden, D.F.M.

Flying Officer: R. Sydenham.

MEDICAL BRANCH.

Flight Lieutenants: D. MacLeod, M.B., Ch.B., I. H. Mercer, L.M.S.S.A.

DENTAL BRANCH

Flight Lieutenants: H. W. Callow, L.D.S., G. W. Cloutman, L.D.S.

CHAPLAINS' BRANCH.

Reverends: R. McLeod, B.A. (C. of E.), E. G. Parke (C. of E.), L. E. Sanders, M.B.E. (Methodist), W. V. Scott (C. of E.), W. A. Thomas, B.A. (C. of E.).

EDUCATION BRANCH

Squadron Leader: V. P. Kelly, B.A.

Flight Lieutenants: R. D. Buckels, B.A., F. W. Ellis, B.Sc., D. R. Morgan, B.A., A. R. M. Watts, B.A., T. M. Webber, B.A.

PROVOST BRANCH.

Squadron Leaders: P. Crossley, D.F.C., G. A. Turner.

Flight Lieutenants: M. Griffith, W. F. McIlgrew.

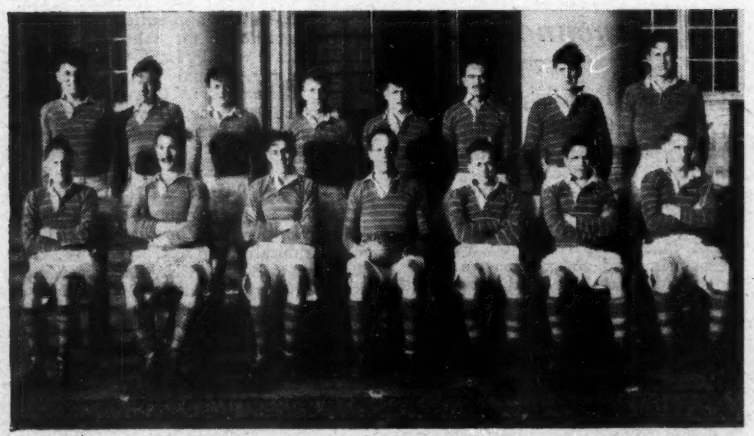
Flying Officers: G. C. Brown, B. D. Godsell, E. J. Horseman, A. Lawson, W. H. McCulloch, C. A. Mumford.

PHYSICAL FITNESS BRANCH.

Flight Lieutenants: P. R. Boulton, R. G. Holloway, E. R. Parsons, G. B. Ramage.

Flying Officers: W. P. Cooper, M. C. Stamford.

Pilot Officer: R. W. Horner.



R.A.F. RUGBY: Members of the R.A.F. College, Cranwell, team, which beat Sandhurst earlier this month: (Back row - L. to R.) Flight Cadets: Furze, Everett, Clements, Phillips, Pavey, Parkinson, Gordon-Johnson, Knapper. (Front row) F/C. Meredith, F/C. Sgt. Skinner, F/C. Fenner, F/C. U/O. Pledger (Captain), Flight Cadets: Mossman, MacPherson, George.

Bd. Pur. Gen